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THE POSITION OF BIRDS' FEET IN FLIGHT.¹

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THE FLIGHT of birds is generally so rapid that our impression as to the position of their feet is often a confused or conventional one, and not always correct, unless our attention has been particularly called to this point. This is shown, for example, in the taxidermist's soaring dove, whose feet are carefully drawn up in front, an erroneous position, as we shall see. In the case of many birds, however, it is not difficult on close observation to see clearly the feet, and to be sure of their position. In others, long study is necessary before the point is clear. The subject has interested me for some years, and I have accumulated a certain number of notes from my own observations and from literature, both of which are briefly summed up in the following paper. All studies of this sort are interesting in themselves, and may be of help in determining relationships.

Birds may be divided into two classes: I, those that habitually carry their feet stretched out behind during flight, and, II, those that carry them drawn up in front.

I. Birds that carry the feet behind.

As far as I know all water-birds habitually carry their feet behind in flight, but a few observations on the different orders may be of interest.

¹ Read at the Annual Meeting of the American Ornithologist Union, November 18, 1908.

PYGOPODES. As the Grebes are practically tail-less, their feet, extended to the rear, are very noticeable, while the feet of the Loon appear like a rudder behind their cutter-built bodies. In fact, it is very probable that the feet in these birds are used, like a long tail, as a rudder.

In the Auk family some have the feet brilliantly colored, so that they are noticeable, as is the case with the Puffin and Black Guillemot, where the feet are bright red. In the case of the Razor-billed Auk the tail is so long that the feet are concealed from above, while in the Murre, they extend slightly beyond the tail. Capt. G. E. H. Barrett-Hamilton (3), speaking of the Auks, says: "Here again the legs are still of considerable assistance to the flying bird, since they may be separated so as to increase the width of the tail; they may be placed both together at one side, or they may be allowed to partially drop and catch the wind with an effect possibly somewhat like that of the string of a kite."

LONGIPENNES. Although I have observed the backward position of the feet in numerous members of the Gull order, the most satisfactory bird to watch, and one with which I have had many opportunities, is the Herring Gull. These opportunities are greatest where the birds are protected and fearless, as is the case in the basin of the Charles River and in Boston Harbor. The legs are habitually extended behind under the tail, the feet generally close together but often apart. In quick turns, the feet are generally dropped pressed together, suggesting their use as a centerboard, for, as in a centerboard boat, quick turns with the board up are impossible, — with it down these turns become easy.

Several observers, namely Barrett-Hamilton (3), Meade-Waldo (15), and Anthony (1), mention the fact that Gulls of various species occasionally fly with one or both legs drawn up in front, more or less completely concealed in the feathers of the breast. Anthony infers that they do this to keep the feet warm, but I have seen this habit when the temperature was 40° Far., and Barrett-Hamilton (3) has observed it in mid-summer. I have observed this habit in the Glaucous and in the Great Black-backed Gull as well as in the Herring Gull. A Herring Gull I was watching had both feet held up in front, showing plainly against its white breast. While I was looking it drew down one foot and extended it behind in the usual manner, flying about in this way for several minutes. Another

bird, while sailing about with both feet behind, dropt them, shook them, and then inserted both in the feathers of the breast. Sometimes the feet carried forward show plainly, at other times they are buried all but the toes which appear as dark nobs, and again they are entirely concealed in the feathers of the breast, so that the bird appears to be destitute of feet. Birds with one foot concealed in front and one carried behind appear to have only one foot. I have noticed the habit both in the immature and in the adult Gulls.

I once saw a Common Tern bring one foot forward and scratch its head during flight — a surprising performance.

TUBINARES. I have never had the opportunity to observe the Albatross family but Barrett-Hamilton (4), in speaking of the flight of an Albatross with its feet stretched out backwards, says: "The legs are frequently moved as if to act as a rudder or to lessen the bird's pace — for example, when descending."

The Shearwaters usually skim so close to the water that their short feet are concealed, and I have not noted them during flight.

Of the Petrels, I have observed the feet extending beyond the tail in Wilson's Petrel, and have discovered that this is an excellent field mark to distinguish this species from Leach's Petrel, where the short feet are concealed below the tail, not even extending beyond the fork (19). This fact has also been noted by Riley (16).

STEGANOPODES. The Gannets, Cormorants, Pelicans, Tropic and Man-o'-War Birds all carry their feet behind. Many photographs by Chapman, Job and others show this point.

ANSERES. All the Ducks, Geese and Swans carry their feet behind, a point that is easily observed in some species. When they alight in the water, the feet are dropped and carried forward wide apart to break their fall. Meade-Waldo (15) states that he once saw a Mallard carry its feet in front during flight, just as has already been described in the case of the Gulls.

ODONTOGLOSSÆ. Chapman's photographs of Flamingos show the legs held behind in flight.

HERODIONES. The dexterity with which the Herons manage their ungainly legs, stretching them out behind in flight, is familiar to all. I once saw a Great Blue Heron attacked in mid-air from the rear by a screaming Tern. The Heron was so startled that it dropt for a moment its long legs, and stretched out and around its snake-like neck. That Storks, Ibises and Spoonbills carry

the legs behind has been affirmed by several observers, and the fact is shown in numerous published photographs.

PALUDICOLÆ. Our common Sora and Virginia Rails in flying short distances generally let their legs dangle straight down, but if the birds get well under way the legs are drawn up behind. The same is true of the American Coot or Fulica.

In the case of Cranes, I have had no experience, but Meade-Waldo (15) states that the legs are carried behind.

LIMICOLÆ. I have made numerous observations on many species of shore-birds, and all carry their legs behind in flight. This is most easily seen in the long-legged waders, but can be observed even in those with short legs.

Among the land birds both classes may be found but I shall continue with those that belong in Class I,—those that carry the feet behind.

GALLINÆ. The Pheasants, Grouse, Bob-whites, etc., all carry their feet behind when well under way, but, as it is probable that they all draw them up in front in starting, or flying only a few feet, their action has often been misunderstood. I have not been able to see the feet in the rapid flight of our Ruffed Grouse and Bob-white, but in the introduced Ring Pheasant, I once watched a flock of young birds in flight whose only partly grown tails did not conceal the long legs of the birds that extended backwards. Meade-Waldo (14) says that all game birds when launched on the wing carry their legs behind. Holdsworth (13) says: "The Pheasant and the Capercaille both rise with their feet in front, and when well on the wing turn them backwards." Hartert (11) states that all game birds carry the legs behind, and quotes Ogilvie Grant, Walter Rothschild and J. G. Millais in support of this assertion. Barrett-Hamilton (3) also confirms this.

COLUMBÆ. The familiar Pigeon of our streets, the descendant of the Rock Dove of Europe, affords an excellent opportunity for the study of the disposition of the feet during flight, yet I have found that even excellent observers are apt to see incorrectly until they have carefully studied the subject. The management of the feet is as in the Gallinæ. On rising from the ground, the Pigeon draws up its feet in front, but, as it gathers headway, the feet are drawn back and extended under the lower tail coverts. In this

position it soars or executes any flight of more than a few yards. When it flies but a short distance it does not have time, or it does not take the trouble, to draw up its feet behind, but carries them in front to be ready to drop them when it alights. In quick turns I have seen them drop their feet a short distance from the tail, so that daylight could be seen between, as has already been described in the case of the Gulls. One I was watching dropped its legs so that they hung straight down for a few seconds, and were then extended behind again. In alighting the feet are thrown forward, generally at the last moment.

RAPTORES. About the position of the feet in the Birds of Prey there has been from time to time considerable discussion, although the matter was apparently settled in the pages of 'The Ibis' in 1894 and 1895, when the Editor, after reviewing an article on the subject by Hartert (11), asked whether British ornithologists agreed with the author. Hartert (9) stated that he was convinced that all birds of prey carried their legs behind in flight, and the same habit had been recorded the year before by Ziemer (20). This observation was confirmed by Selater (17), Barrett-Hamilton (2), Meade-Waldo (14) and Cordeaux (6), each having noted this habit in one or more species. Meade-Waldo had also observed it in trained Falcons. Hartert (12), in a later article on the subject, quoted E. C. Stuart Baker and Ogilvie Grant as sustaining him against the popular idea that the feet are carried in front. He also states that Kestrels when about to strike carry their legs forward and extended, and this is doubtless true of other Hawks. Barrett-Hamilton (3) says that while the normal position of the feet of Kites is backwards, still he "feels sure that Kites, like Gulls, can use either the backward or the forward position."

When the new U. S. twenty dollar gold piece appeared in 1907 with the design by St. Gaudens of an Eagle in flight, its legs behind, a protest went up. A writer in the Boston 'Transcript' said: "Whoever saw an eagle in flight with its legs trailing behind it like a heron?," thus voicing the popular idea that the legs are carried in front.

My own observations on this point in Birds of Prey are limited to the Osprey, Sparrow, Marsh, Rough-legged and Red-shouldered Hawks. At Bristol, R. I., the Ospreys are semi-domesticated,

for they build their nests on tall poles, erected for their convenience in barn-yards, and allow inspection at close range. Under these circumstances one can easily see that the legs are extended behind in flight,—and carried close under the tail. On one occasion I watched two Red-shouldered Hawks soaring together. In one the feet were stretched close under the tail, while the other had dropped them slightly, so that daylight was visible between the tail and the feet. A Sparrow Hawk that flew by me at Ipswich within 30 yards, showed the feet trailing behind, with a distinct gap between the tail and the legs, very much as in the St. Gaudens design.

The only observation I have made in the Owl family, was in the case of a Great Horned Owl that I watched flying about in one of Mr. John E. Thayer's large cages. In this case the legs were drawn to the rear and not forward, and the faster the bird flew the more the legs were extended behind. Meade-Waldo (15) states that the legs of Owls are carried behind, and Finley (7) has published an interesting photograph of a Barn Owl in full flight, where the legs are plainly extended behind. Mr. F. H. Kennard tells me that some Barred Owls that he kept always extended their feet behind in flight.

PSITTACI. Finn (8) has observed the feet carried behind in the Indian Parrot, *Palæornis torquatus*. Beebe (5) says of the Finsch Amazon Parrots in flight: "Each little foot clinched tightly close to the tail feathers."

COCYGES. Finn (8) by careful and long observations has determined that both Cuckoos and Kingfishers carry the feet behind. He observed birds in the wild state and also when confined in rooms for this purpose.

II. *Birds that carry the feet drawn up in front.*

In our review of the orders of North American birds, all have been considered but these, namely: Pici, Macrochires and Passeres.

PICI. The observations of Finn (8) are the only ones that I can find in this order. He has observed a Woodpecker carrying the feet in front in flight. I have often endeavored to determine this point in the Flicker, but have been as yet unable to do so.

MACROCHIRES. To determine the position of the feet during flight in the Goatsuckers, Swifts and Hummingbirds is a difficult problem, owing to the smallness of the feet and the habits of flight in this order, and I have no observations of my own to record. Finley has taken a photograph of a Hummingbird hovering about a flower in which the feet are in front. A photograph by Chapman (5¹) shows the same state of things. It is possible, however, that in full flight the feet may be extended behind. This order may therefore be put in the undetermined list.

PASSERES. The great order of perching birds alone remains, and it would seem natural that they should carry the feet in front as they fly from place to place, so as to be ready to seize their perch. As far as I know, this is the case. Barrett-Hamilton (3) gives a list of several passerine birds in whom he has observed the forward position of the feet, including the English Blackbird, Raven, Rook, and others of the Crow family. The Crow is our largest common Passerine bird, but its black color of plumage and feet makes it difficult to observe on the point in question. A Crow, in rising on the wing, often lets its feet hang at first, and then draws them up in front in an exceedingly leisurely manner. When well under way the feet are close against the breast, and are held there, I am inclined to believe, even in long flights, for I have several times observed Crows at Ipswich from a point in the dunes or beach where I could follow their flight for a long distance, and, as they passed me, their feet were always in front. I have notes of a Crow migrating along the beach one April day, flying slowly, and showing plainly the feet held in front, but dropped slightly so that daylight could be seen between them and the breast. This I have seen in other cases also. The feet are often held so close to the breast that only the clenched toes can be seen, while in other cases the feet seem to be entirely buried in the feathers. That excellent observer, Edmund Selous (18), gives a drawing of flying Ravens in which the feet are drawn up in front.

Other passerine birds, where I have been able to see the feet when the bird was in full flight, are: Red-winged Blackbird, Bronzed Grackle, English Sparrow, Eave, Tree and Barn Swallows, and Robin. In all of these the feet were carried in front.

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ORNITHOLOGICAL MISCELLANY FROM AUDUBON WARDENS.¹

BY B. S. BOWDISH.

IT is my purpose to give here a few of the notes of interest gathered from letters and reports of wardens. Such notes are some of the incidental results of the warden system of the National Association of Audubon Societies.

BROWN PELICANS.—Brown Pelicans, on Pelican Island, Florida, started nesting nearly a month ahead of the usual time, or the first

¹ A paper presented to the American Ornithologists' Union, Cambridge, Mass. November 19, 1908.

week in November. At one time in January there were about 1000 occupied nests. A severe storm and high tide struck them in February; the birds first hatched were just able to fly; the rest were destroyed, the water making a clean sweep over the island. Of 2500 not over 600 escaped. Later about 75 nests were built but for some unknown reason they abandoned the island without hatching.—*Paul Krogel*, Pelican Island Reservation, Florida, Sept. 9, 1907.

This has been the most successful season the birds have had since the island was made a reservation. A good many birds died in February through cold and exposure during stormy weather, otherwise the total would have been from six to eight hundred larger. The second brood came through very well; they can all fly with the exception of about 30. There are about 1000 birds on the island now, young and old. The second brood numbers between six and seven hundred birds, most of which are still around the island. This season puts the island ahead of what it used to be years ago, as there were certainly more birds than I have ever seen on it before. There will probably be birds on the island until nesting starts again, unless a storm drives them off.—*Paul Krogel*, Pelican Island Reservation, Florida, Sept. 1, 1908.

ROSEATE SPOONBILL.—Five years ago there was a fine flock of Roseate Spoonbills or "Pink Curlews" that used and did their feeding in the northeast end of Turtle Bay; only 18 are left now of the flock, and they have for the past two seasons done their feeding on my home island in the fall and winter months. Hunters and tourists killed them, and there are but few left on the Gulf coast of Florida.—*Columbus G. McLeod*, Sunset Island, Florida, 1907.

AMERICAN WHITE PELICAN.—A small flock of White Pelicans fed during the winter and early spring months in the northeast end of Gasparilla Sound. There were about 50, but they are decreasing from shooting for wings, feathers and for mounting. Nearly all the birds except pelicans and cormorants go to the main land to feed.—*Columbus G. McLeod*, Sunset Island, Florida, 1907.

BLACK SKIMMERS.—Black Skimmers began nesting three weeks earlier than in 1906.—*Asa M. Pillsbury, Jr.*, Passage and Indian Keys Reservations, Florida, 1907.

There was heavy weather on the 19th of April which destroyed

about three quarters of the nests and eggs of the Skimmers, also some of the young birds. There was left after the storm enough nests to produce say 6000 young ones. All the young of all broods are now able to take care of themselves.—*Adam Thibodeaux*, East Timbalier Island Reservation, Louisiana, July 8, 1908.

Young Skimmers are disturbed if people visit the Reservation. They lie quiet upon the first approach of a person, but after a time they will start away and run into the water, and when it is rough on the beach the little things are beaten down and drowned.—*Asa N. Pillsbury, Jr.*, Passage and Indian Keys Reservations, Florida, Oct. 1, 1908.

ROYAL TERN.—The storm tide which occurred June 14 destroyed nests with eggs, about 30,000 in number, including about 15,000 Royal Terns' eggs, and as the breeding places were low islands the Royal Terns did not re-build thereon, but a few of them went to Battledore Island.—*Wm. M. Sprinkle*, Breton Island Reservation, Louisiana, 1907.

TERNS.—(Under this head are included Common, Arctic and Roseate, which are not readily distinguished by the wardens; also Least Terns). First Terns seen May 20; plenty May 25. The terns did not arrive as early as usual this year, on account of the cold. On July 14 there were plenty of eggs and young. People have remarked that the terns were very plenty this year. The fishermen in this vicinity like very much to have the terns here; they tell me they are as good as a compass, and by them they locate the fish. I have not heard of a single violation this year.—*Geo E. Cushman*, Bluff and Stratton Islands, Maine, 1907.

The terns did not seem to be as many as usual this year, and I soon found that a portion of the colony had joined the one on Fisher's Island, two miles across the bay. A few eggs were trodden by sheep. The birds left this vicinity about the middle of July, somewhat earlier than usual.—*Henry M. Cuskey*, Libby Island, Maine, 1907.

The terns died off badly on account of the cold and lack of food at time of hatching.—*James E. Hall*, Matinicus Rock, Maine, 1907.

The spring was backward, cold and rainy, and most birds were late in nesting. There were as many if not more eggs laid as in

any year since I began to take note of them. Terns are noticeably increasing.—*F. N. Johnson*, Swanns Island, Maine, 1907.

The medrics (terns) came about the usual time and the nests soon had from one to four eggs and in one case five. The nests were very plenty and one had to be very careful not to step on the eggs, lying upon the sand, rocks, grass, and even upon the solid ledges, in some cases rolling down hill. After hatching, the long, cold rains killed some of the young, many birds being found lying about the island.—*Willis Snow*, Metinic Island, Maine, 1907.

There is a herring weir on the north side of the island and the terns come there in large flocks and sit on the weir stakes and binders and get a great many small herring out of the weir. It does not seem to annoy the parties who own the weir. There is a ledge near there where the birds sit at low water and they seem very tame. Power boats can run very near them, and they don't seem at all alarmed, I think they are much more numerous and also gaining the good will of the public.—*Howard T. Ball*, Deer Isle, Maine, 1907.

About 3000 young terns were hatched, of which about 200 died, leaving 2800 reared.—*Emanuel Nelson*, Woods Hole, Mass., 1907.

The terns were later than usual; many young died and many eggs failed to hatch owing to cold and late season.—*Henry O. Rackett*, Gardiner's Island, New York, Sept. 13, 1907.

Least Terns are about extinct here; otherwise, except the Gull-billed Terns, all species are much more abundant within a radius of 20 miles from Smith's Island north than they were three years ago. On a small lump of about one acre, 140 yards from this station, 17 pairs of Common Terns nested this season and laid three eggs each, from the 51 eggs rearing 43 young, but I do not think the other colonies will average as well, as they were not so near to the station, and I could not keep the Crows away, and they eat many eggs and also some young.—*J. R. Andrews*, Cobb's Island, Va., 1907.

We had a heavy rain followed by a second one a day or two afterward, about the second day of August, and I found on the 12th that the young terns had perished by the score; and there seemed to be hundreds of dead young ones, all or nearly all about the same age, and quite a few eggs, dry and unhatched.—*Willis Snow*, Metinic Green Island, Maine, August 27, 1908.

For some reason unknown to me the terns vacated Channel Rock where there were a goodly number last year, and until the middle of July there were no birds to speak of, and only one nest, on Sloop Island Ledge. Since that time they have come to Sloop Island Ledge and built from 20 to 25 nests and raised their young. Since the breeding season was over I have frequently seen large numbers of birds rise from there but none on Channel Rock. I can discover no reason for their leaving Channel Rock; I can not see that they have been disturbed by any one. I think by appearances that they like Sloop Island Ledge and will return there another year. They have increased considerably in numbers since I first became warden, but they have not been as plenty this year as last.—*Howard T. Ball*, Eagle, Maine, Sept. 7, 1908.

In June, at Green Island, there were lots of terns breeding, also on Stratton Island, this year. I don't think the terns have been breeding on Green Island before for years. On Bluff Island the cows in pasture had stepped on some young terns and killed them.—*George E. Cushman*, Bluff and Stratton Islands, Maine, Sept. 1, 1908.

Terns arrived here May 18. The first egg was found June 1; the first young July 1. About 500 young were hatched at the new colony on Foster's Island. Most of the terns have left here and gone further up the bay in pursuit of a small fish called brit on which they feed.—*Henry M. Cuskey*, Bucks Harbor, Maine, Sept. 4, 1908.

The terns have all gone from here, have not seen any since September 14. The approximate number of old birds was about the same as last year but there was an increase of about 150 in young.—*Emanuel Nelson*, Woods Hole, Massachusetts, Sept. 22, 1908.

HERRING GULL.—Some few young died as soon as out of the shell, owing to the extreme cold. Only one old gull died this season.—*Osmond Cummings*, Cone Island, Maine, 1907.

Gulls are getting very tame; they are known to follow the fishermen and seize their trauls for the bait; they even come about the huts when the fishermen are baiting their trauls.—*Dennis Driscoll*, Gotts Island, Maine, 1907.

All Herring Gulls breed on Pulpit Rock and Camp Island, and

terns on Freeman's Rock and Egg Rock. This has been a very good year for all wild birds; no heavy sea to disturb their nests. Very few young died and there has been no eggng to my knowledge. The Indians that have given us some trouble in years past, on Camp Island and Pulpit Rock, have not landed on the islands this year.— *O. B. Hall*, Great Wass Island, Maine, Sept. 14, 1907.

There were about 1400 Herring Gulls, raising about the same number of young. The increase over last year was about 200.— *Fred. E. Small*, Cross Island, Maine, 1907.

It has seemed to me that the proportion of nests with eggs that did not hatch has been larger this year than last, I think owing to the extremely cold spring, but apparently the birds found food more abundant, and they seemed to grow faster and were more hardy. I have found a smaller number of crippled young and old birds this year than ever before. We were visited by an eagle in July and he killed several young gulls before I could drive him off. I have found four gulls that came home to die, being wounded at sea. Aside from young killed by the eagle the greatest number lost were killed by old gulls when one bird's young tried to take the food from another adult.

The gulls came to their nesting grounds on No Mans Land the last of March. The first nest was seen April 15. Young gulls commenced to leave the nesting home August 6. On September 8 all young birds were able to care for themselves.— *Mark Young*, Matinicus Island, Maine, 1907.

Not as many eggs were laid by the gulls this season as heretofore; reason, too much ice on the island this spring. Many of the eggs laid did not hatch on account of cold weather.— *John H. Malone*, Isle Royale, Michigan, 1907.

Have noticed that crows eat gulls' eggs and kill and eat young gulls when small.— *Frank F. Witte*, Huron Island, Michigan, 1907.

There was a very satisfactory increase in the number of nests this year, but the final outcome was very disappointing. The Crows destroyed many of the eggs, and a flock of 32 sheep on my island and 20 more on the adjoining one were a source of much annoyance to the gulls. The weather also was very bad all through the season and the fierce gales and heavy seas killed many of the young birds. After the storm I would find young birds almost as

large as their parents and able to fly strongly, dead among the stones, having been blown or washed in and killed. Unlike other years, the birds seem reluctant to leave, and many are still lingering around their nesting places. They have also exhibited much less fear this year, and on our home island have become quite tame, although they seem to know the difference between ourselves and strangers.—*George C. Jones*, Four Brothers Islands, New York, Sept. 15, 1907.

The gulls arrived here the last of April; the first egg was found May 26; first young, July 1. *Henry M. Cuskey*, Bucks Harbor, Maine, Sept. 4, 1908.

It is very difficult to determine the number of gulls for they have increased wonderfully. We find them in all the harbors and inlets during the day, but at night they return to the Duck Islands. They are doing splendidly and have not been molested at all.—*Dennis Driscoll*, Gotts Island, Maine, September 5, 1908.

There has been abundance of herring all along the coast and the old gulls have been scattered all along the shore. They are very plenty, but they have not laid as many eggs this year as last.—*O. B. Hall*, Jonesport, Maine, Sept. 9, 1908.

The old birds are going fast. The young gulls are in good condition.—*Wm. F. Stanley*, McKinley, Maine, Sept. 8, 1908.

There were more eggs of each species laid this spring than were hatched, owing to the cold spring.—*John H. Malone*, Isle Royal Light Station, Michigan, Sept. 3, 1908.

I do not notice any increase in the number of gulls around this place although a great many were bred here; there do not seem to be any more now than there were this spring, and I can not account for it except that they scatter and go all over. Of course, the hawks and owls kill some, but I have found the remains of only four that I thought were killed in that way.—*John A. McDonald*, Passage Island, Michigan, September 1, 1908.

Arriving at the islands on May 2, several nests were found containing one or two eggs, but none at that time with the full set of three. From then until the middle of the month the nests were built very rapidly, and on May 28 the first young bird was hatched. On this date a careful count showed 327 eggs, which number was increased later by 21, found after the falling water permitted a

more thorough search of the shores. The per cent. of young hatched was very high, as I found not more than 12 eggs unhatched. The general exodus of the birds took place during the last week of August, nearly all being gone by September 1. I estimate that fully 75 eggs were destroyed by Crows. This loss occurred on only one island, which being heavily wooded afforded a place of concealment for the Crows from which they could steal upon the nests while the old birds were away. I found one nest where all three of the eggs had been broken and the contents not yet eaten. Others I found with only two small holes through which the contents had evidently been sucked. I was unable to find any evidence that they destroyed any young birds. Including the eggs destroyed, I estimate the number of eggs laid as 450, which was a very considerable increase over last year. The four islands, containing each about four acres, afford an admirable breeding ground, which should, in time, become a very large colony.—*B. G. Boone*, Four Brothers Islands, N. Y., Nov. 7, 1908.

It is a pleasure for me to report that this has been a very good year for the birds breeding on Old Man Island. The island contains only about 7 acres, which is small for the number of birds breeding there.—*Fred E. Small*, Bucks Harbor, Maine, April 31, 1908.

LEACH'S PETREL.—The Mother Cary's Chickens' nests are in evidence, but of course one can not tell what is within unless the birds are disturbed. A number of years ago I saw a nest dug out, and a very sleepy looking, small, hook-billed bird was found.—*Willis Snow*, Metinic Island, Maine, 1907.

I have previously made mention of the terrible slaughter of petrels by minks upon Western Egg Rock. These minks have caused the petrels to emigrate to Eastern Egg Rock, and the evidence of the slaughter is quite apparent to any one who might visit this place. The gulls have been forced to seek a home in other localities. As soon as the law permits me I shall begin killing the minks in the hope that they may be wholly exterminated before the birds begin to breed again.—*E. E. Bailey*, New Harbor, Maine, August 29, 1908.

Very many petrels have stopped around the island, but none have nested this season.—*Osmond Cummings*, Cone Island, Maine, 1907.

I have not given an account of the Storm Petrel (Leach's), for the reason that it is so difficult to determine the number, as they are abroad only at night, but judging from the number of burrows where they make their nests there are not as many as formerly.—*Dennis Driscoll*, Gotts Island, Maine, September 5, 1908.

There are thousands of the Stormy (Leach's) Petrels here at this writing.—*Wm. F. Stanley*, McKinley, Maine, Sept. 8, 1908.

LAUGHING GULL.—High tides in June destroyed all the eggs, but the gulls rebuilt and there was a large increase over last year.—*R. S. Ludlam*, Stone Harbor, N. J., 1907. (See note of *G. D. Hitchens*, in the 'General Notes,' below.)

It is 15 miles from this station to the main land; there is a marsh in the middle of this bay ten to twelve miles long and three fourths of a mile wide. On July 11, 1907, while standing on that marsh, looking north and south, a distance, I think, of at least two miles each way, Laughing Gulls and terns were as thick as you ever saw blackbirds, as far as the eye could see, and there were a few Willets. The gulls and terns are equally thick all over the marsh, and as plenty as I have ever known them. I have, with two other men, years ago, taken 1000 eggs a day. It would take 20 days to hunt that marsh over, and when it was hunted over we could begin again and find as many more from the 10th of June to the 25th of July. There is a sandbar across this inlet, about four acres in extent, and rising about eight feet above high tide. Three weeks ago there were over 1000 young Black Skimmers, not yet able to fly; to-day there are over 400 still too young to fly; these birds have been hatching since July 25. There are lots of them flying now, of the first breeding.—*J. E. Johnson*, Hog Island, Virginia, Sept. 16, 1907.

EIDER DUCK.—This has been one of the best seasons for the birds since I have been warden; I do not think they have been disturbed in any way this year. There were about 30 Eider Ducks, raising about 40 young.—*Fred E. Small*, Cross Island, Maine, 1907. (See note by *Osmond Cummings* under 'General Notes'.)

When I was appointed warden there were two Eider Ducks breeding on the Old Man Island, and at present I have 60. If there were a law to abolish all spring shooting it would be a matter of a short time when we would have a large colony of ducks on this coast.—*Fred. E. Small*, Bucks Harbor, Maine, August 31, 1908.

GENERAL NOTES.—Sandpeeps are here in large numbers, as in preceding years; also plovers of different species. About 1500 Shags (Cormorants) fly in over the island in the morning and out at night. Black Ducks make it a stopping place but none nest; also Eider or Sea Ducks abound in very large numbers.—*Osmond Cummings*, Cone Island, Maine, 1907.

Do you think the mere handling of foliage concealing a nest of young birds will leave a scent upon the leaves or ferns that will attract prowling enemies to the nest and prove the death of the young birds? Last year, deep in the woods, I found a wren's nest near a brook. Brushing aside the ferns to see the nest I found four young, helpless birds. Next day the nest was vacant, not even the mother bird being seen. Did a mink find the nest of young birds and gobble them up, attracted to the place by the scent of my hand upon the foliage? Again, this last June I found a ground-bird's nest near my camp, containing four young birds, entirely helpless. Next day these birds were gone! What happened to them? Did a prowling skunk smell the scent of my hand on the foliage about the nest, investigate, and then find and devour the baby birds? If so, bird lovers must be careful not to handle the foliage about nests, lest by doing so they bring death to the nestlings. I am puzzled to explain these instances in any other way, and I find upon inquiry numbers of my fellow guides have had similar experiences.—*Edgar E. Harlow*, Kineo, Moosehead Lake, Maine, 1907.

There were 15 swallows' nests under the lantern deck of the tower. Last year a Robin built its nest within 20 feet of our 10-inch steam-whistle fog-signal and held the fort.—*Wm. F. Stanley*, Great Duck Island, Maine, 1907.

A large number of duck eggs was spoiled by the cold, late spring, and the second laying was smaller than the first.—*Alfred Eastgate*, Stump Lake Reservation, North Dakota, 1907.

Increase of gulls and terns is hampered by the taking of eggs up to the 20th of June. The slow increase of Willets and Wilson's Plover is due to their being shot after July. The reason of the slow increase of Oystercatchers is that they are early layers and most of the first hatching die from the effects of the cold, wet spring weather.—*G. D. Hitchens*, Smiths Island, Virginia, 1907.

While camping on the Penobscot River recently I saw a Sparrow Hawk pursuing a sandpiper. They came flying down the river, the hawk soon coming close to its intended victim. Suddenly, just as its pursuer swooped down upon it, the sandpiper made a quick turn in the air and dove into the river entirely out of sight. The outwitted hawk at once sheered off into the forest, and a few seconds later the sandpiper rose to the surface of the water fully 20 feet from where it had entered it, and escaped unharmed up the river. I call that a brave little fellow, resourceful and clear-headed almost to the point of reason.—*Edgar E. Harlow*, Kineo, Maine, September 3, 1908.

The birds in my district are all in flocks getting ready to take their southern trip; and I have counted many little flocks and I have not seen a flock, that I could count correctly, but what had more young ones in it than old ones, both gulls and terns. I think this was the best hatch-out of young gulls and terns I have had in years.—*J. R. Andrews*, Oyster, Va., Sept. 3, 1908.

The birds were so numerous this season that it was almost impossible to make any estimate; on the Middle Ground or Little Island Key, a beach of about 100 feet square, the nests were so thick that there was no room at all to land. The same conditions prevailed at Rock Key. These two places do not have beaches at all times; they are rocks covered with water, but some years the sand washes up and makes a sand beach, and if no storm occurs during the season the birds have a good breeding, but if the sand washes away then the eggs are lost, and they have to come here on Sand Key and begin their breeding over again. This was a very successful season; no storm of any account occurred, no eggs were taken or destroyed, and the largest number of birds breed on these places. I visited a few of the islands and found several birds breeding on Man Key, Woman Key, and Ballast Key; on these islands cranes (herons), curlews (ibises), cormorants and pelicans breed. I think it would take all the time of two wardens to protect the birds on this new reservation.—*Chas. G. Johnson*, Key West Reservation, Florida, Sept. 3, 1908.

The small number of plume birds that I had last breeding season, and that I was so proud of, have not returned this season to nest on Sunset Island. I suppose they must have nested somewhere

in the interior and long since been shot. However, I saw a few lately on the breeding ground. I do hope that the flock of Pink Curlews (Roseate Spoonbills) have escaped this summer and will pay me a visit now soon. It is not yet time for the flock of White Pelicans to put in their appearance.—*Columbus G. McLeod*, Placida, DeSota County, Florida, Oct. 1, 1908.

On most parts of the islands, on almost every two square feet was a nest containing 5 or 6 eggs (Laughing Gulls, Brown Pelicans, Black Skimmers, Blue and White Herons, Black-crowned Night Herons).—*Joseph F. Bilos*, Tern Islands Reservation, Louisiana, Sept. 8, 1908.

I think that public sentiment is growing against the killing of the birds; when we first began to look after them the killing of gulls was taken as a matter of course; men out gunning would often bring down a gull just to try their skill; now it is a rare thing that one is killed. People are beginning to feel above it. I am strongly in favor of the abolition of all spring shooting; the birds are gradually diminishing.—*F. N. Johnson*, Swans Island, Maine, August 28, 1908.

Eight years ago I came to this station. At that time there were only two Puffins, specimens having been taken a few years previous to the number of four or five. Since that time the birds had increased to the number of three or four pairs which nested here in 1906. I think specimens must have been taken last year, as I have seen only two of them this summer. The noise from motor boats may have caused them to abandon this locality, however.—*M. E. Tolman*, Matinicus, Maine, Sept. 3, 1908.

All birds except Common Terns are on the increase. There were 14 young Canada Geese raised on the islands this year. Can not give any estimate on ducks, as all sloughs dried up, driving all the young to the big lake.—*Alfred Eastgate*, Stump Lake Reservation, North Dakota, Sept. 6, 1908.

There has been a good increase in all birds this year, as there has been no high tide during the breeding season, and no one disturbed the eggs after the law was out. There are more birds this fall than there has been since I have been warden. Willets are getting quite thick in the fall.—*George D. Hitchens*, Brighton, Virginia, Sept. 1, 1908.

About the last part of May there was a storm and high tides that destroyed many of the Mud Hens' (Clapper Rails) eggs. They laid again, May 25 to 28; high tides drowned many young Marsh Hens. The Black-headed Gull (Laughing Gull) and Strikers (Terns) are as plentiful as last season. The Flood Gulls (Black Skimmers) are on the increase, but the August storm, I think, has drowned many of that bird, as they principally nest on an outer island called Pig Island. I notice this storm has washed that island almost flat, and there are many young ones not yet able to fly.—*J. E. Johnson*, Hog Island, Virginia, August 29, 1908.

I think that the following birds that formerly nested here in numbers are now nesting further south: Willets, Sea-crows (Oystercatchers?) and Black-headed Gulls (Laughing Gulls). I hear that 20 miles down the bay they are spoken of as being unusually abundant. The only bird here that seems more abundant than usual is the Mud Hen (Clapper Rail); there has not been so much eggng done for the last two or three years. Willets, Sea-crows and Black-headed Gulls never did nest as plentifully on this beach as on others further south, possibly because it is so low, and they like higher beaches where there is an abundance of fine shells. About every six or seven years we have a high tide that seems to sweep the shells off the beach.—*Howard F. Jones*, Assateague Beach, Virginia, August 29, 1908.

The increase in Marsh Hens (Clapper Rails) has been very large. It is the opinion of all with whom I have talked that more young of all species have been raised this season than ever before.—*J. A. D. Savage*, Wachapreague, Virginia, Sept. 8, 1908.

The Legislature, repealing the law preventing the shooting of Robin Snipe, was, I think, responsible for the Gulls (Laughing) failing to nest near my station this season, owing to the wholesale shooting of them by residents.—*L. F. Taylor*, Flander Island and Metomkin Beach, Virginia, Sept. 3, 1908.

NOTES ON THE SUMMER BIRDS OF NORTHERN
GEORGIA.

BY ARTHUR H. HOWELL.

THE literature of Georgia ornithology is not extensive. The only complete list of the birds of the State is a nominal list of 269 species, published in a German magazine in 1855 by Alexander Gerhardt on the authority of one White.¹ In this paper, the author gives interesting and valuable notes on the life histories of 43 species, drawn from his personal observations during a residence of several years in northern Georgia. These notes furnish, in the case of several birds, the only published records of the breeding of the species in the State.² Only two local lists from Georgia, both of which are very incomplete, have thus far appeared.³ Scattering notes relating to Georgia birds are likewise few in number and most of them refer to the southern part or to the region close to Atlanta. With the exception of Gerhardt's paper, practically nothing concerning the northern part of the State has been published, and while many northern-breeding birds have been supposed to inhabit the mountains, which are continuous with the ranges in North Carolina, definite knowledge as to the species summering there and the southern limits of their distribution has been lacking.

The field work of the Biological Survey during the summer of 1908 included an examination of the fauna and flora of the Southern States to determine the boundaries of the life zones. In connection with this investigation I visited northern Georgia in July and spent about three weeks collecting and studying the birds, mammals, and plants of the higher mountains. Three localities were visited, as follows: Tate, Pickens County, and Grassy Mountain (3290 feet), about six miles northeast of Tate, July 4-6; Ellijay, Gilmer

¹ Naumannia, V, 1855, pp. 382-384.

² This paper appeared in three installments, as follows: Naumannia, V, 1855, pp. 380-397, 458-469; VI, 1856, pp. 1-18.

³ 'Birds of Kirkwood, De Kalb County, Georgia,' by Robert Windsor Smith, in Wilson Bulletin, X, pp. 49-59, 1903, listing 126 species; 'Memoranda of a Collection of Eggs from Georgia,' by H. B. Bailey, in Bull. Nutt. Orn. Club, VIII, pp. 37-43, 1883, listing 104 species, which list would be extremely valuable if exact localities had been given.

County, and Rich Mountain (4081 feet), about ten miles northeast of Ellijay, July 7-8; Young Harris, Towns County, and Brasstown Bald (4768 feet), about five miles southeast of Young Harris, July 10-20.

Brasstown Bald¹ is the highest mountain in Georgia² and is part of a high ridge marking the boundary line between Union and Towns counties. Continuing southward, this ridge turns west and forms the boundary between Union and Lumpkin counties.

Practically all of extreme northeastern Georgia (including Gilmer, Fannin, Union, Towns, and Rabun counties) is occupied by a series of high ridges which form the southern end of the Blue Ridge system. In this region are found numbers of peaks over 4000 feet in altitude and several over 4500 feet. Rich Mountain in eastern Gilmer County, and Grassy Mountain in northern Pickens County are parts of the same system, directly continuous with the higher ridges in Fannin and Union counties. Grassy Mountain is the most southern peak reaching an altitude of 3000 feet. South of there the peaks are much lower and mainly isolated. The valleys are mostly narrow, and range in altitude from 1100 feet at Tate to 1900 feet at Young Harris.

The greater part of northern Georgia is included in the Upper Austral Zone (Carolinian area) which covers all mountains less than 3500 feet in altitude, and reaches approximately to that altitude on the higher peaks. Transition Zone (Alleghenian area) is found on the peaks and ridges above 3500 feet and descends somewhat lower than that on cold slopes and in shaded ravines. No pure Canadian Zone exists in this region, although a few Canadian species of mammals and plants occur in a very restricted area at the summit of Brasstown Bald. No spruces or firs are found on these mountains.

On the lower slopes oaks (numerous species) are the prevailing

¹ Designated as 'Mt. Etna' on the Rand-McNally Map of Georgia ('Mt. Etna' on old sheets of the Geological Survey), and is doubtless the mountain called 'Fodder Bald' by Guyot. It is known simply as 'The Bald' to the residents of the region.

² Sitting Bull Mountain (5046 feet), listed under Georgia in Gannett's 'Dictionary of Altitudes,' is higher than Brasstown Bald, but as mapped by the U. S. Geological Survey is in North Carolina. This mountain, I am informed by the U. S. Coast and Geodetic Survey, is one of the southern peaks of the Nantahala Mountains (Lat. 35°, Long. 83° 31'). It is the mountain called 'Little Bald' (5030 feet) on the Dahlonega Quadrangle of the U. S. Geological Survey.

trees, with which are associated hickories, chestnuts, gums (*Nyssa sylvatica*) tulip trees (*Liriodendron*) and other characteristic Carolinian forms. Pines of two species (*Pinus rigida* and *P. virginiana*) are found in scattering clumps, and hemlocks (*Tsuga canadensis*) grow along the streams. Among the characteristic birds found in this area may be mentioned *Bæolophus bicolor*, *Thryothorus ludovicianus*, *Icteria virens*, *Seiurus motacilla*, *Piranga rubra*, *Empidonax virescens*, and *Cardinalis cardinalis*.

At about 3500 feet altitude most of the Carolinian species disappear and a number of characteristic Alleghenian forms are first seen. On the upper slopes the prevailing trees are white oak and chestnut, with which are found hickories, locust (*Robinia*), red maple, striped maple*¹ (*Acer pennsylvanicum*), cherry-birch* (*Betula lenta*), chestnut oak (*Quercus prinus*), laurel (*Kalmia*), rhododendron (*R. maximum*), flame azalea* (*A. lutea*), purple-flowering raspberry* (*Rubacer odoratum*), small-flowered hellebore* (*Veratrum parviflorum*), etc. The characteristic birds of this area are *Junco h. carolinensis*, *Lanivireo s. alticola*, *Dendroica cærulescens*, *Dendroica virens* and *Dendroica blackburniæ*.

Near the summit of Brasstown Bald the soil is thin and rocky and the tree growth much stunted. On the shaded northeast slope dense thickets of rhododendron and laurel cover the cliffs and rough rock piles and furnish suitable conditions for the presence of Canadian forms. Here were found the southern yellow birch (*Betula alleghanensis*), mountain maple †² (*Acer spicatum*), Carolina rhododendron (*R. catawbiense*), the Wilson Thrush (*Hylocichla fuscescens*), a mountain salamander † (*Plethodon sñermani*), the Smoky Shrew † (*Sorex fumeus*), and the Cloudland White-footed Mouse † (*Peromyscus nubiterræ*). The following list of 76 species, based almost entirely on the birds observed or collected on this trip, though obviously incomplete, is offered as a contribution to our knowledge of the avifauna of this little known area. Thirteen species are here first recorded as occurring in the State during the breeding season: *Corvus corax principalis*,³ *Coturniculus*

¹ Species starred are characteristically Alleghenian.

² Species marked with a dagger are characteristic of Canadian Zone.

³ An indefinite record for Georgia is found in John Abbott's letter to George Ord (1814), in which he says, "The Raven only frequents the back inland Countries of Georgia & can inform you nothing more of it." (Auk, XXIII, 1906, p. 367.)

savannarum australis, *Junco hyemalis carolinensis*, *Zamelodia ludoviciana*, *Spiza americana*, *Lanivireo solitarius alticola*, *Mniotilta varia*, *Dendroica aestiva*, *D. caerulescens cairnsi*, *D. blackburniae*, *D. virens*, *Seiurus aurocapillus*, and *Hylocichla fuscescens*.

In the list which follows, records unaccompanied by specific localities apply to all the localities visited.

***Butorides virescens*.** GREEN HERON.—An immature specimen was taken at Young Harris, July 11.

***Philohela minor*.** WOODCOCK.—One was flushed, July 12, from an open oak knoll in the valley at Young Harris.

***Colinus virginianus*.** BOB-WHITE.—Common at Young Harris and on lower slopes of Brasstown Bald; rather uncommon at Tate and Ellijay.

***Bonasa umbellus*.** RUFFED GROUSE.—Breeds sparingly on Brasstown Bald. My assistant got within 150 yards of one that was drumming near the summit July 17, and another hunter saw a female on top of an open ridge at about 4000 feet, acting as if she had young. In the region about Ellijay, grouse were reported by several people to occur in small numbers, and a few are said to be found in the rough country north of Grassy Mountain. This is close to their present southern limit. In former years they were much more common in this region. There is a specimen of this bird from Georgia (without specific locality) in the U. S. National Museum, taken by Prof. Leconte in 1847.

***Meleagris gallopavo silvestris*.** WILD TURKEY.—Occurs on Brasstown Bald in small numbers. Three were shot in one day last winter on the mountain by a hunter. In the Rich Mountain region they are reported to be very scarce.

***Zenaidura macroura carolinensis*.** MOURNING DOVE.—A few noted at Tate and at Young Harris.

***Cathartes aura septentrionalis*.** TURKEY VULTURE.—Fairly common throughout north Georgia; seen at all altitudes on Brasstown Bald.

***Buteo borealis*.** RED-TAILED HAWK.—Not common; one seen on Grassy Mountain.

***Otus asio*.** SCREECH OWL.—Scarce; one flushed from a thicket of pines and oaks at Tate.

***Bubo virginianus*.** GREAT HORNED OWL.—Occurs sparingly on Brasstown Bald.

***Coccyzus americanus*.**

***Coccyzus erythrophthalmus*.**—Cuckoos were fairly common in this region, but I was unable to determine the species. Both are recorded as breeding in north Georgia by Gerhardt.¹

***Ceryle alcyon*.** BELTED KINGFISHER.—One noted at Young Harris.

¹ Naumannia, VI, 1856, pp. 12-13.

Dryobates villosus auduboni. SOUTHERN HAIRY WOODPECKER.—Occurs in small numbers throughout the mountains; seen at Ellijay and Grassy Mountain.

Dryobates pubescens. DOWNY WOODPECKER.—Not common; seen at Tate and near the summit of Rich Mountain.

Phloeotomus pileatus.—PILEATED WOODPECKER.—Found sparingly throughout the mountains; noted at Brasstown Bald and Grassy Mountain.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—Scarce; one seen at 3500 feet on Rich Mountain.

Centurus carolinus. RED-BELLIED WOODPECKER.—One seen in heavy timber on lower slope of Rich Mountain.

Colaptes auratus. FLICKER.—Not common; seen at Ellijay, Tate, and Young Harris.

Antrostomus vociferus. WHIPPOORWILL.—One heard singing, July 11, at Young Harris. Recorded as breeding by Gerhardt.¹

Chordeiles virginianus. NIGHTHAWK.—Not common; a few noted at Ellijay and at Young Harris.

Chaetura pelagica. CHIMNEY SWIFT.—Generally common throughout the region. On Brasstown Bald they were constantly coursing over the tops of the highest peaks.

Trochilus colubris. RUBY-THROATED HUMMINGBIRD.—A few noted in the valleys.

Tyrannus tyrannus. KINGBIRD.—One seen at Ellijay and several at Young Harris.

Myiarchus crinitus. CRESTED FLYCATCHER.—Rather uncommon; seen at Tate and on Brasstown Bald up to 4000 feet.

Sayornis phoebe. PHOEBE.—Several seen on Brasstown Bald up to 3000 feet. A nesting record is given by Gerhardt (under the name *Muscicapula olivacea*!).²

Myiochanes virens. WOOD PEWEE.—Common in the valleys, and on the mountains to 4000 feet.

Empidonax virens. GREEN-CRESTED FLYCATCHER.—Common in the valleys and on the lower slopes of the mountains.

Cyanocitta cristata. BLUE JAY.—Fairly common on Brasstown Bald, where several were seen in the rhododendron thickets at the summit. A few noted at Tate.

Corvus corax principalis. NORTHERN RAVEN.—Ravens are reported to occur in small numbers on Brasstown Bald. My guide told me he knew of a nest where young were raised in the spring of 1908.

Corvus brachyrhynchos. AMERICAN CROW.—Occurs in small numbers at Young Harris. One noted at Tate.

Icterus galbula. BALTIMORE ORIOLE.—I saw no orioles in this region,

¹ Naumannia, VI, 1856, p. 3.

² Naumannia, V, 1855, p. 387.

but was shown a nest in a tree at Young Harris which closely resembled nests of this species. It is recorded as a breeder by Gerhardt.¹

Astragalinus tristis. AMERICAN GOLDFINCH.—Common in small flocks; seen up to 4500 feet on Brasstown Bald.

Coturniculus savannarum australis. GRASSHOPPER SPARROW.—Several noted and one taken at Young Harris.

Spizella passerina. CHIPPING SPARROW.—Common in the valleys and on the mountains to 4500 feet.

Spizella pusilla. FIELD SPARROW.—Common in the valleys and on the lower slopes of the mountains.

Junco hyemalis carolinensis. CAROLINA JUNCO.—Common on Brasstown Bald and Rich Mountain above 3500 feet altitude. The latter locality probably marks their southern limit quite closely, since they were not found on Grassy Mountain, slightly farther south. Both adults and young were collected.

Peuceea aestivalis bachmani. BACHMAN SPARROW.—One was seen at Tate in dry oak woods; evidently rare in this region. Has been recorded as breeding at East Point, near Atlanta.² A specimen was shot at Rising Fawn, Georgia, Aug. 21, 1885, by J. T. Park and identified by Dr. C. Hart Merriam.

Pipilo erythrophthalmus. TOWHEE.—Common at Young Harris and on Brasstown Bald, where it ranges to the very summit. At Ellijay it was scarce, and only two or three pairs were noted in the valleys. The only one seen farther south was on Grassy Mountain at about 3000 feet. Specimens were taken at Ellijay and Young Harris.

Smith, in his list of birds of Kirkwood, states that this species is not known to breed there, but in a report sent to the Biological Survey he mentions seeing a single bird there on June 25, 1903. The Towhee breeds on Lookout Mountain in northwest Georgia, as indicated by a report received by the Biological Survey from J. T. Park, who found the species in July, 1884, on the mountain near Rising Fawn. Gerhardt³ records this species as nesting in bushes at a height of 4 to 5 feet.

Cardinalis cardinalis. CARDINAL.—Observed rather sparingly in the valleys.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEAK.—One adult male was seen on July 13 in a grove of oaks at Young Harris. They probably breed in small numbers in that region.

Passerina cyanea. INDIGO BUNTING.—Common in the valleys and on the mountains to 4000 feet.

Spiza americana. BLACK-THROATED BUNTING.—This bird probably does not breed in Georgia at the present time; it seems desirable, however, to record an instance of its nesting in the State in 1883, furnished by J. T.

¹ Naumannia, VI, 1856, p. 1.

² W. J. Mills, Wilson Bull., XII, 1905, p. 116.

³ Naumannia, V, 1855, p. 465.

Park an intelligent observer, then stationed at Rising Fawn. In a letter to Prof. W. W. Cooke, dated July 21, 1885, he states that a pair of Black-throated Buntings nested in a clover patch near his house in that year, and adds that the species was never observed there except during that season.

Piranga erythromelas. SCARLET TANAGER.— Not common; one was heard singing on Grassy Mountain, a male was seen on Rich Mountain, and several were noted on Brasstown Bald — in each case at an altitude of about 2500 feet. Gerhardt records this species as a breeder in north Georgia.¹

Piranga rubra. SUMMER TANAGER.— Fairly common in the valleys; one was taken at 2600 feet altitude on Brasstown Bald.

Progne subis. PURPLE MARTIN.— Common at Young Harris, but not seen elsewhere.

Vireosylva olivacea. RED-EYED VIREO.— Rather uncommon; seen at Tate and Ellijay, and on Brasstown Bald up to 4400 feet altitude.

Lanivireo flavifrons. YELLOW-THROATED VIREO.— Observed in small numbers in the valleys and up to 3000 feet on the mountains.

Lanivireo solitarius alticola. MOUNTAIN SOLITARY VIREO.— Common on Brasstown Bald between 3500 and 4500 feet and on Rich Mountain above 3700 feet. Both young and adult birds were taken. The young individuals were singing in subdued tones.

Vireo noveboracensis. WHITE-EYED VIREO.— Two heard singing at Ellijay; not noted elsewhere.

Mniotilta varia. BLACK-AND-WHITE WARBLER.— Common in the valleys and on the mountains to 4500 feet. This species is omitted from Smith's list of birds of Kirkwood, but reports in the Biological Survey from several observers indicate that it breeds at Kirkwood and Atlanta.

Helminthophila chrysoptera. GOLDEN-WINGED WARBLER.— A male of this species was seen, but not secured, July 11, at 2500 feet on Brasstown Bald. J. T. Park, in a letter to Prof. W. W. Cooke, reports seeing a pair of these birds feeding young at Rising Fawn, Georgia, June 24, 1885. The male parent and one young bird were shot.

Dendroica aestiva. YELLOW WARBLER.— Fairly common at Tate and at Young Harris.²

Dendroica caerulescens cairnsi. CAIRNS WARBLER.— Fairly common on Brasstown Bald and Rich Mountain above 3500 feet altitude. One female was seen near the base of Rich Mountain (1600 feet). Both adults and young were taken, the latter in full fall plumage.

Dendroica blackburniae. BLACKBURNIAN WARBLER.— Two specimens were taken at 4300 feet on Brasstown Bald and an immature individual at 3500 feet on Rich Mountain.

Dendroica virens. BLACK-THROATED GREEN WARBLER.— Two immature specimens were taken at the summit of Rich Mountain (4000 feet) and

¹ Naumannia, V, 1855, pp. 462-463.

² Smith, in his list of birds of Kirkwood says of it: "rare; not known to breed."

one at 4300 feet on Brasstown Bald. Evidently breeds throughout these mountains. J. T. Park in a letter to Prof. W. W. Cooke reports them common on Lookout Mountain, near Rising Fawn, Georgia, in June, 1885. A female in breeding condition was shot by him there, and identified by Dr. C. Hart Merriam.

***Dendroica vigorsii*.** PINE WARBLER.—A few noted at Tate and a little company of four or five (a family of young and their parents) at 3000 feet on Brasstown Bald.

***Seiurus aurocapillus*.** OVENBIRD.—A few seen on Rich Mountain between 3000 and 4000 feet; occurs sparingly on Brasstown Bald from 2500 to 4000 feet. Smith, in his list of birds of Kirkwood gives this species as a rare migrant. J. T. Park found the Ovenbird breeding on Lookout Mountain, near Rising Fawn, Georgia, in June, 1885.

***Seiurus motacilla*.** LOUISIANA WATER-THRUSH.—Fairly common along streams on the lower slopes of the mountains (up to 2200 feet) and in the valleys.

***Oporornis formosa*.** KENTUCKY WARBLER.—Fairly common in the valleys; seen up to 2200 feet on Brasstown Bald.

***Geothlypis trichas trichas*.** MARYLAND YELLOWTHROAT.—Common in the valleys; singing. Several specimens taken, both adults and young.

***Icteria virens*.** YELLOW-BREASTED CHAT.—Common in the valleys, seen up to 2500 feet.

***Wilsonia citrina*.** HOODED WARBLER.—A pair observed in a laurel thicket at Tate.

***Mimus polyglottos*.** MOCKINGBIRD.—One seen at Ellijay; not noted elsewhere.

***Dumetella carolinensis*.** CATBIRD.—Common in the valleys, and on Brasstown Bald to 4300 feet.

***Toxostoma rufum*.** BROWN THRASHER.—Seen in small numbers in the valleys.

***Thryothorus ludovicianus*.** CAROLINA WREN.—Common in the valleys, and on the mountains to 4000 feet.

***Thryomanes bewickii*.** BEWICK WREN.—A few seen at Young Harris, and one on Rich Mountain at 3500 feet. A breeding record is given by Gerhardt (under the name *Troglodytes americanus*).¹

***Sitta carolinensis*.** WHITE-BREASTED NUTHATCH.—Scarce; one taken at 4000 feet on Brasstown Bald and several seen at the same altitude on Rich Mountain.

***Bæolophus bicolor*.** TUFTED TITMOUSE.—Fairly common up to 4000 feet.

***Penthestes carolinensis*.** CAROLINA CHICKADEE.—Observed in small numbers in the valleys and up to 4400 feet on the mountains.

***Poliptila cærulea*.** BLUE-GRAY GNATCATCHER.—A few seen at Tate.

***Hylocichla mustelina*.** WOOD THRUSH.—Common in the valleys and up to 4000 feet on the mountains.

¹ Naumannia, V, 1855, pp. 461-462.

Hylocichla fuscescens. WILSON THRUSH.—A few pairs breed on the summit of Brasstown Bald, where they are confined to the dense rhododendron thickets on the cool slopes. One was secured July 16, and on the following day several were heard calling and singing faintly.

Planesticus migratorius achrusterus. CAROLINIAN ROBIN.—Occurs sparingly on Brasstown Bald and in the surrounding valleys. An adult and a young bird were taken at 4500 feet. The robin is mentioned as a breeder by Gerhardt.¹

Sialia sialis. BLUEBIRD.—Fairly common; seen up to 4000 feet on Rich Mountain.

THE TAGGING OF WILD BIRDS AS A MEANS OF STUDY- ING THEIR MOVEMENTS.²

BY LEON J. COLE.

It is needless in introducing this subject to dwell upon the so-called mysteries of migration. To call the facts of migration mysterious is merely to say that we do not understand them, for when we do come to understand them, though they may still remain marvellous, they can no longer be mysterious. That migration will nevertheless still probably remain a phenomenon to be wondered at is because it is, in all likelihood, of a nature widely different from anything in the ordinary experience of mankind. If man possesses any such homing sense, it is only in the most rudimentary and undeveloped condition. And it is probably for this very reason, this element of mystery, that man has from earliest time taken a lively interest in the question of the migration of birds.

But how much nearer are we to a real solution of the problem of migration than we were a hundred or two hundred years ago? Much data has been accumulated, many details have been learned as to where birds go and to a certain extent by what routes, and many poorly grounded theories have been overturned and left behind. But still the goal is ahead. For although the coming

¹ Naumannia, V, 1855, pp. 390-391.

² Read before the American Ornithologist's Union, Cambridge, Mass., November 18, 1908.

of the birds in the spring and their departure in the fall are among the most apparent of natural phenomena about us, and must be noticed by everyone, it is quite another matter when it comes to the details of their movements.

Most of the knowledge of the migrations of birds which has been gleaned up to the present time is of their *mass* movements; scarcely anything is known of what becomes of an individual bird after its departure in the fall from its summer home, or, I might even say, after it has reared its young. It is truly wonderful that birds can wing their way from the region where they breed to a far distant land, and then, with the return of proper conditions, find their way back again to the same region. But how much more wonderful if they come back to the very locality which they left the year before! And how little exact knowledge we have of their ability to do this! It is the purpose of the present paper to outline a plan by which it is hoped that much data of a definite kind can be secured, not only as to the great migrations of birds, but regarding their minor movements as well. Furthermore, it is believed that light may be shed on many subsidiary problems.

The fundamental basis of the plan is a simple one, and one which is not new at this time. It is, briefly, the attaching of identifiable tags or bands upon birds, together with directions so that they may be returned if again found. It may be of interest to those who are not already familiar with the fact to know that probably the first person in this country to try this method was no less than Audubon himself. In his 'Birds of America,'¹ after describing in a delightful way his intimacy with a nest of Phœbes, or, as he calls them, "Pewee Flycatchers," he says: "I attached light threads to their legs: these they invariably removed, either with their bills, or with the assistance of their parents. I renewed them, however, until I found the little fellows habituated to them; and at last, when they were about to leave the nest, I fixed a light silver thread to the leg of each, loose enough not to hurt the part, but so fastened that no exertions of theirs could remove it." His birds left duly in the fall, but he adds: "At the season when the Pewee returns to Pennsylvania, I had the satisfaction to observe

¹ Audubon, John James. *Birds of America*, New York and Philadelphia, 1840, Vol. I, p. 227.

those of the cave, in and about it. There again, in the very same nest, two broods were raised. I found several Pewees' nests at some distance up the Creek, particularly under a bridge, and several others in the adjoining meadows, attached to the inner parts of sheds erected for the protection of hay and grain. Having caught several of these birds on the nest, I had the pleasure of finding that two of them had the little ring on the leg."

In 1901,¹ the writer, unaware at that time of Audubon's experiment, suggested that much might be learned of the movements of birds by a system of tagging, if a suitable method could be devised. No definite steps were taken at that time, however, to carry out the plan.

Some two or three years later Mr. P. A. Taverner of Detroit, Mich., announced through 'The Auk'² that he proposed to attach small aluminum bands to the tarsi of young birds, in the hope that some of them might later fall into the hands of ornithologists and the records be returned to him. On his band was stamped the direction: "Notify The Auk, N. Y.," together with a serial number for identification of the individual band. Mr. Taverner writes me that comparatively few birds have been banded, and of these but a single record has returned to date. This was of a Flicker tagged by Mr. Chas. Kirkpatrick at Keota, Keokuk Co., Iowa, May 29, 1905.³ On the following Christmas day this bird was taken by Mr. J. E. Roos at Many, Sabine Co., Louisiana. During the present year the capture has been reported⁴ of two ducks, a Canvasback and a Redhead, both wearing bands marked with the initials "T. J. O. D." These were taken in New Jersey, within a week or two of each other, in the fall of 1907.

Up to the present time it has not been learned, so far as I am aware, who placed the bands upon these birds. Unless this person is found these last records can have no especial value, but they nevertheless help to emphasize the fact that a certain proportion

¹ Cole, Leon J. Suggestions for a method of studying the migrations of birds. 3d Rept. Mich. Acad. Sci., 1901, pp. 67-70, 1902.

² Auk, Vol. XXI, p. 410, July, 1904.

³ Taverner, P. A. Tagging Migrants. Auk, Vol. XXIII, p. 232, April, 1906.

⁴ Oldys, Henry. Capture of a tagged Canvasback Duck. Auk, Vol. XXV, No. 1, p. 80, Jan., 1908.

Woodruff, E. Seymour. Another Capture of a Tagged Duck. Auk, Vol. XXV, No. 2, p. 216, April, 1908.

of returns may be expected from this sort of work. The use of tags by Dr. Watson¹ to study the homing instinct of Noddy and Sooty Terns at the Tortugas, illustrates the way in which the method may be applied experimentally.

Now as to the sort of results that may be expected from this method of investigation: Not only will it aid in the study of the general migration of a species, but by giving us records of the movements of individual birds, will assist us in analyzing the factors connected with migration in detail. A moderate number of successful "returns" should help in settling such questions as: Are the residents of a locality, or the migrants going further on, the first to arrive in the spring? Do the residents leave before the northern contingent arrives in the fall, or are they the last to go? Do males, females and young travel together, or do one or another go ahead? What is the exact route taken from any locality, and is the same route travelled each year? Furthermore it must be borne in mind that the migration problem is probably but a special phase of the homing problem, and that such questions as whether birds commonly return to the same locality to breed, and whether the young return to the locality in which they were reared, are very pertinent to its solution. I should like to emphasize further the importance of the bearing of the homing instinct, both in birds and in other animals, were there time. I can only express it, however, as my firm belief that a comparative study (observational combined with experimental when possible) of such phenomena as the annual migrations of the fur seals, and of bats, and of many fishes, as well as of the homing of animals in general (toads, ants, bees, and in fact all animals which return to a definite place) is going to be of the greatest value in understanding the "mysteries" of the migration of birds, where the instinct appears to be developed in its highest form.

Answers to certain of the questions stated above have already been found, but most of them depend upon a knowledge of the *movements of individual birds*, and to ascertain these we must have some means of identifying the individual. This is the purpose served by the numbered bands.

¹ Watson, John B. "The Behavior of Noddy and Sooty Terns." Publication 103, Carnegie Inst. Wash., Paper VII, pp. 187-225, pll. i-xi, March, 1909.

There are several ways in which the banding may be carried on, but banding the young before they leave the nest is probably the most feasible. This can, of course, be done only with those birds which attain practically their full growth before they attempt flight. In these birds the tarsus is, as a rule, about as large when the fledglings leave the nest as it ever becomes; there is no danger, therefore, that the bands will ever become too tight. If one is inclined to doubt this one should recall that this is the method of recording individuals universally employed by breeders of pigeons and canaries, which once banded, carry the bands for life. In the case of chickens, turkeys, and similar fowls, it is necessary either to replace the bands by larger ones as the birds grow, or else to open them out.

Still another problem which might be attacked in this way is the geographical extension of certain species. What better way, for example, of studying the dispersal of the Starling, which is gradually extending its territory about New York and in Southern New England? Do the old birds leave the places where they were reared and seek habitation elsewhere, or are the young the pioneers? The length of time required to attain adult plumage, and many similar questions would also receive light.

It is not the purpose of the plan systematically to shoot birds in order to recover the bands, nor to encourage the same, but fate sooner or later brings many birds into man's hands. However deplorable it may be, many of our birds (such as Robins and Bobolinks) are shot when they go South in the fall, and while such a condition exists advantage may as well be taken of it.

Directions for the return of the band are stamped upon it. Probably almost anyone finding a bird bearing a tag with a definite address would know what was desired of him, but possibly it may be advisable to offer a small reward to the finder as an additional stimulus. A certain amount of advertising in sporting and similar journals might aid as well.

In other cases it may be possible, as Audubon did, to catch the birds upon the nest and examine them without harm. Furthermore (as Mr. Taverner has suggested to me in a letter), anyone in a suitable locality could trap small birds, band them and release them. This continued systematically through successive seasons

and migration periods could hardly fail to yield valuable results. If a bird previously banded were trapped, the record could be made and the bird again released.

Birds which nest in large colonies, such as the gulls, terns, herons, etc., offer especial advantages for banding and making subsequent observations, and excellent work can be done by anyone who has an opportunity to carry on the work at one of their breeding places.

Finally, as to the scheme of coöperation which is proposed. Last winter the New Haven Bird Club decided to undertake the banding of birds upon a small local scale. A committee was appointed for the purpose of organizing the work, bands were secured, and a plan of records drawn up. The plan is very simple. Upon the top half of a card approximately 5×8 inches in size, is a printed blank form for recording the data of banding, number of band, species of bird, locality, date, and similar facts. On the lower half is a similar form for recording the data in connection with the return of the band, in case it ever comes back. Small booklets containing perforated detachable slips bearing the same form as the upper part of the card are supplied to those who propose to do banding, and when a bird is banded the data are recorded in this book. In the fall the books and all the surplus bands are called in, and the records are then transferred to the permanent cards. Since the numbers on the cards corresponding to those of the bands are arranged consecutively, the record for any band can be turned to directly. A separate index of species is all that is needed to make the system complete.

As to the bands themselves, it was the idea of the Committee at first to use closed or seamless bands whenever possible, and to use open bands only in the case of adult birds. The bands are of aluminum, and are stamped "Box Z, Yale Sta., New Haven, Conn.," in addition to the number. For several practical reasons it will probably be better, as Mr. Taverner has done, to use long open bands, which can be clipped off to make them the proper size, and it is also probable that the "return" address used by him will be adopted.

It was found that the number of birds tagged this year was rather disappointingly small, and it seemed desirable to enlist the help, when possible, of persons outside the Club who were in a position

to help. Further discussion with ornithologists from other sections resulted in a determination to make the plans of much wider scope. Now if the work is to be done generally, it seems greatly to be desired that only one kind of band be used, and to avoid confusion in the numbers, that all bands be distributed and records kept by a central organization. With this in view, the Committee asked for an extension of powers, which now enable it to push the work as seems best, to invite the coöperation of anyone who can help, and furthermore gives it jurisdiction over the records, thus placing them in the hands of those who do the work. The Committee as appointed by the Club consists of Dr. Louis B. Bishop, Mr. Clifford H. Pangburn, and the writer.

Upon its part, the Committee has agreed to be no further expense to the Club, since it has determined to throw itself for support and assistance in carrying on the work entirely upon the generosity and coöperation of such persons as are interested. Among others, Mr. Taverner has generously offered his hearty coöperation, agreeing to act as an advisory member of the Committee, and has volunteered to turn all his bands and records over to the central depot. Similar support has already been offered by others. It is intended now to prepare a large number of bands for the coming season, together with directions for using them. It is hoped to secure a number of interested persons in different sections of the country who will coöperate with the Committee, and act as local distributing agents for bands.¹ It will be their business to attend to the distribution of bands and blank recording forms to any in their locality who are willing to aid in tagging; and at the close of the season to call in the records and unused bands, and to forward the records for transference to the permanent cards.

If the present paper shall have aroused any interest in this plan of attacking the problems of migration, and similar little-understood phenomena, it will have accomplished its purpose, and the Committee will be very glad to correspond with any who are willing to coöperate in the work.²

¹ A number of well-known ornithologists have already agreed to act in this capacity.

² Address Dr. Leon J. Cole, Yale University, New Haven, Conn.

A LIST OF THE BIRDS OF WESTERN SOUTH DAKOTA.

BY STEPHEN SARGENT VISHER.

THE list is based upon the following sources of information:

(1) The birds observed while sent out by the Geological and Natural History Survey of South Dakota to the Black Hills (August 1 to 24, 1908) and to the Bad Lands (August 24 to September 18). The northern half of the Hills were thoroughly studied; and an area forty miles by thirty miles, having its southwestern third in the badlands, extending from the White River near Interior east to Kadoka, and north to Cottonwood, on the C. N. W. R. R., was gone over. Several years spent in eastern South Dakota and an extensive western trip, has given the author a familiarity with these birds that makes the observations, I hope, reliable.

(2) Upon the list of the birds collected in 1857 and 1860 in what is now South Dakota by H. V. Hayden (late director of the U. S. Geological Survey) while on the Warren Expedition.

(3) Upon the list of the birds collected by G. B. Grinnell, Zoölogist to the Custer Expedition in 1874. He entered the Hills from the north July 20, continued south to the south central part (Harney Peak), swung east and north, leaving at the north corner (Bear Butte) August 16.

(4) H. E. Lee, now of Pierre, has done much good work, particularly upon the water birds of Bryant County, in the north-eastern part of the State.

(5) E. H. Sweet of Vermillion, South Dakota, spent from June, 1907, to September, 1908, on a claim just north of the Bad Lands in southwestern Stanley County, and observed in the area between the White River and the N. W. R. R. line, and between Interior and Kadoka. He did a little collecting. Sweet was my kind host during the time I spent in this area.

(6) Henry Behrens, of Rapid City, has for several years collected about Rapid, which lies in the eastern foot-hills. Most of his collection was gathered near his ranch in Spring Creek Valley, eight miles south of Rapid; all within twenty miles of Rapid City. His collection consists of about three hundred and fifty mounted

birds, representing one hundred and fifty species. Few records of abundance or of breeding have been kept.

LIST.

1. *Colymbus nigricollis californicus*. EARED GREBE.—Taken by Behrens. The most common grebe (Behrens).
2. *Colymbus auritus*. HORNED GREBE.—Two taken by Behrens. Rare.
3. *Podilymbus podiceps*. PIED-BILLED GREBE.—Two taken by Behrens. Rare.
4. *Gavia immer*. LOON.—One taken by Behrens.
5. *Larus delawarensis*. RING-BILLED GULL.—Taken by Grinnell on Little Missouri River; also by Behrens.
6. *Hydrochelidon nigra surinamensis*. BLACK TERN.*—Common summer resident.¹
7. *Pelecanus erythrorhynchos*. AMERICAN WHITE PELICAN.—Taken by Behrens. Migrant.
8. *Mergus americanus*. AMERICAN MERGANSER.*—Found nesting on Castle Creek (Grinnell).
9. *Lophodytes cucullatus*. HOODED MERGANSER.*—One taken in July by Sweet.
10. *Anas platyrhynchos*. MALLARD.*—Abundant migrant.
11. *Chaulelasmus streperus*. GADWALL.—Taken by Behrens.
12. *Mareca americana*. BALDPATE.—Nesting abundantly on Heart River (Grinnell). Taken by Behrens in May and June.
13. *Nettion carolinensis*. GREEN-WINGED TEAL.—Abundant migrant, as early as Sept. 1.
14. *Querquedula discors*. BLUE-WINGED TEAL.*—Breeds. These two are the dominant ducks.
15. *Spatula clypeata*. SHOVELER.*—Abundant migrant in southwest Stanley County.
16. *Dafila acuta*. PINTAIL.*—Abundant migrant.
17. *Marila vallisneria*. CANVAS-BACK.*—Reported common on White River in fall.
18. *Marila affinis*. LESSER SCAUP DUCK.—Two taken by Behrens.
19. *Clangula clangula americana*. AMERICAN GOLDEN-EYE.—Taken by Behrens once; May 4, 1902.
20. *Charitonetta albeola*. BUFFLE-HEAD.—Two taken by Behrens.
21. *Erismatura jamaicensis*. RUDDY DUCK.*—Common migrant; probably breeds.
22. *Chen hyperborea nivalis*. GREATER SNOW GOOSE.—Two taken by Behrens.

¹ An asterisk indicates the species represented in Behrens's collection.

23. *Branta canadensis*. CANADA GOOSE.— Abundant on Little Missouri River (Grinnell). Rare migrant (Sweet).
24. *Branta hutchinsi*. HUTCHINS GOOSE.— Rare migrant (Sweet).
25. *Botaurus lentiginosus*. AMERICAN BITTERN.* — Common summer resident (Sweet).
26. *Ardea herodias*. GREAT BLUE HERON.* — A few breed (Grinnell). Rare fall migrant (Sweet).
27. *Butorides virescens*. GREEN HERON.— A rare fall migrant on White River (Sweet).
28. *Rallus virginianus*. VIRGINIA RAIL.— One, Heart River (Grinnell).
29. *Porzana carolina*. SORA RAIL.— Four taken (Behrens).
30. *Fulica americana*. COOT.* — Abundant breeder in the few suitable localities.
31. *Phalaropus fulicarius*. RED PHALAROPE.— One taken, May 27, 1904, by Behrens.
32. *Lobipes lobatus*. NORTHERN PHALAROPE.* — Taken by Grinnell on Missouri River.
33. *Steganopus tricolor*. WILSON PHALAROPE.— Common migrant in southwest Stanley County.
34. *Recurvirostra americana*. AVOCET.— Occasional on Missouri River (Grinnell). One taken October 16, 1902, on Ranch; one September 5, 1903, on Box Elder Creek (Behrens).
35. *Gallinago delicata*. WILSON SNIPE.— Common migrant (Sweet). Probably breeds (Behrens).
36. *Micropalama himantopus*. STILT SANDPIPER.— Common migrant. Six taken by Behrens.
37. *Pisobia maculata*. PECTORAL SANDPIPER.— Abundant migrant.
38. *Pisobia bairdi*. BAIRD SANDPIPER.— Common migrant in southwest Stanley County.
39. *Pisobia minutilla*. LEAST SANDPIPER.* — Common migrant in southwest Stanley County.
40. *Limosa fedoa*. MARBLED GODWIT.— Two taken by Behrens.
41. *Catoptrophorus semipalmatus inornatus*. WESTERN WILLET.— Probably breeds; taken (Behrens).
42. *Totanus flavipes*. LESSER YELLOW-LEGS.— Common migrant.
43. *Helodramas solitarius*. SOLITARY SANDPIPER.— Abundant migrant and breeder.
44. *Heteractitis incanus*. WANDERING TATLER.— One female taken by Behrens on his Ranch, June 1, 1901. "Very Rare."
45. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.* — Common breeder on the plains.
46. *Actitis macularia*. SPOTTED SANDPIPER.* — Abundant breeder, in Hills as well as plains.
47. *Numenius longirostris*. LONG-BILLED CURLEW.* — Tolerably common breeder in wilder parts of plains country.
48. *Oryechus vociferus*. KILLDEER.* — Abundant breeder in badlands.

49. *Colinus virginianus*. BOB-WHITE.*—Breeds near Rapid City. Very rare visitant (Sweet).
50. *Dendragapus obscurus*. DUSKY GROUSE.—Tolerably common in central part of the Hills (Hayden).
51. *Bonasa umbellus umbelloides*. GRAY RUFFED GROUSE.—Female taken. One brood seen in the Hills.
52. *Tympanuchus americanus*. PRAIRIE HEN.—Reported occasionally as far west as Kadoka.
53. *Pediocetes phasianellus campestris*. PRAIRIE SHARP-TAILED GROUSE.—Abundant resident on plains.
54. *Centrocercus urophasianus*. SAGE GROUSE.*—Very locally distributed; resident.
55. *Zenaidura macroura carolinensis*. MOURNING DOVE.*—Common breeder. In autumn, when it flocks, it is very conspicuous.
56. *Cathartes aura septentrionalis*. TURKEY VULTURE.*—Tolerably common about the Hills. Abundant in badlands.
57. *Circus hudsonius*. MARSH HAWK.*—Most abundant hawk outside of the Hills proper. Resident.
58. *Astur atricapillus*. GOSHAWK.—Four taken by Behrens.
59. *Accipiter velox*. SHARP-SHINNED HAWK.—A pair, probably of these birds, was seen in badlands.
60. *Buteo borealis calurus*. WESTERN RED-TAILED HAWK.*—Tolerably common breeder.
61. *Buteo borealis kreideri*. KREIDER HAWK.—Rare; only one seen.
62. *Buteo lineatus*. RED-SHOULDERED HAWK.—Two taken by Behrens.
63. *Buteo swainsoni*. SWAINSON HAWK.*—Abundant in fall on plains. Breeds (Sweet).
64. *Archibuteo lagopus sancti-johannis*. AMERICAN ROUGH-LEGGED HAWK.*—Rare.
65. *Archibuteo ferrugineus*. FERRUGINOUS HAWK.*—Abundant resident in winter (Sweet).
66. *Aquila chrysaëtos*. GOLDEN EAGLE.*—A resident in the badlands (Sweet). Seen in the Hills.
67. *Haliaeetus leucocephalus*. BALD EAGLE.*—Rare, resident in badlands (Sweet).
68. *Falco mexicanus*. PRAIRIE FALCON.—Abundant in badlands. Breeds. Three pairs taken by Behrens.
69. *Falco peregrinus anatum*. DUCK HAWK.—Six taken by Behrens. One seen on Bear Butte, near Sturgis.
70. *Falco columbarius*. PIGEON HAWK.—Rare autumn migrant. Four pairs taken by Behrens.
71. *Falco columbarius richardsoni*. RICHARDSON MERLIN.—Five taken by Behrens. Seen in southwest Stanley County.
72. *Falco sparverius*. SPARROW HAWK.*—Very abundant summer resident.

73. *Pandion haliaëtus carolinensis*. OSPREY.— One seen in September on the White River; one taken by Behrens.

74. *Asio wilsonianus*. AMERICAN LONG-EARED OWL.— A tolerably common breeder, in the cedars in the badlands, and in the Hills. Four pairs taken by Behrens.

75. *Asio flammeus*. SHORT-EARED OWL.* — Common breeder on the plains. Rare resident (Sweet).

76. *Otus asio*. SCREECH OWL.— Taken frequently by Behrens.

77. *Bubo virginianus pallescens*. WESTERN HORNED OWL.— Taken in winter by Sweet. Nine taken by Behrens.

78. *Nyctea nyctea*. SNOWY OWL.— Taken by Behrens in the winter.

79. *Speotyto cunicularia hypogaea*. BURROWING OWL.— Abundant on plains in prairie dog towns.

80. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.— Five taken by Behrens.

81. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.— Seen on White River (Sweet). Taken on Bad River by Hayden in 1857.

82. *Ceryle alcyon*. KINGFISHER.* — A common breeder.

83. *Dryobates villosus*. HAIRY WOODPECKER.* — Breeds; probably resident in Hills.

84. *Dryobates pubescens nelsoni*. NORTHERN DOWNY WOODPECKER.— Three taken in the Hills (Grinnell). Rare resident (Sweet).

85. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.* — Most abundant woodpecker, taking the area as a whole.

86. *Asyndesmus lewisi*. LEWIS WOODPECKER. — Very abundant breeder in central wilder part of the Hills; uncommon elsewhere. In flight it resembles a small crow. This woodpecker is very proficient as a flycatcher.

87. *Colaptes auratus luteus*. NORTHERN FLICKER.* — Tolerably common breeder (Sweet).

88. *Colaptes cafer collaris*. RED-SHAFTED WOODPECKER.— Abundant in the Hills.

The most abundant woodpecker along the White River seems to be a hybrid between these Flickers.

89. *Phalaenoptilus nuttalli*. NUTTALL POORWILL.— Heard in June in the badlands (Sweet). Taken in the Black Hills by Hayden.

90. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.* — Abundant breeder on the plains.

91. *Chaetura pelagica*. CHIMNEY SWIFT.— Reported by Grinnell from the Hills.

92. *Aëronautus melanoleucus*. WHITE-THROATED SWIFT.— Abundant breeder about the higher buttes in the badlands.

93. *Tyrannus tyrannus*. KINGBIRD.* — Abundant breeder, except in the central Hills.

94. *Tyrannus verticallis*. ARKANSAS KINGBIRD.* — Abundant summer resident on the plains.

95. *Sayornis phoebe*. PHOEBE.— Male taken by Behrens on his ranch, May 26, 1904.
96. *Sayornis saya*. SAY PHOEBE.* — Abundant summer resident on the plains, especially in the badlands.
97. *Myiochanes richardsoni*. WESTERN WOOD PEWEE.— Most common flycatcher in the Hills.
98. *Empidonax virescens*. GREEN-CRESTED FLYCATCHER.— One male taken by Behrens.
99. *Empidonax traillii*. TRAILL FLYCATCHER.— "One male taken" (Behrens).
100. *Otocoris alpestris leucolaema*. DESERT HORNED LARK.*— Abundant resident.
101. *Pica pica hudsonia*. MAGPIE.*— Numerous wherever there are trees, except in higher parts of the Hills. Resident.
102. *Cyanocitta cristata*. BLUE JAY.— Rare summer resident on White River as far west as southwest Stanley County.
103. *Perisoreus canadensis*. CANADA JAY.— Tolerably common in Hills. Pair taken (Behrens).
104. *Corvus corax sinuatus*. AMERICAN RAVEN.— Common (Grinnell). Taken at Fort Pierre (Hayden).
105. *Corvus brachyrhynchos*. AMERICAN CROW.— Tolerably common. Resident.
106. *Nucifraga columbiana*. CLARK NUTCRACKER.— Taken by Hayden in the Hills. (Sweet saw one of these birds in the fall of 1903 in Hutchins County, southeast part of the State.)
107. *Cyanocephalus cyanocephalus*. PIÑON JAY.*— Abundant breeder about Rapid City; not seen elsewhere.
108. *Dolichonyx oryzivorus*. BOBOLINK.*— Common summer resident in the Red Valley east of the Hills proper. Rare along the White River (Sweet).
109. *Molothrus ater*. COWBIRD.— Abundant summer resident except in the higher Hills.
110. *Xanthocephalus xanthocephalus*.— YELLOW-HEADED BLACKBIRD.*— Common breeder.
111. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.*— Common summer resident.
112. *Sturnella magna*. MEADOWLARK.— Occasional on White River (Sweet).
113. *Sturnella neglecta*. WESTERN MEADOWLARK.*— Abundant on prairies and plains.
114. *Icterus spurius*. ORCHARD ORIOLE.— Common along the White River in summer (Sweet).
115. *Icterus galbula*. BALTIMORE ORIOLE.— Same as preceding species. Rare breeder (Behrens).
116. *Icterus bullocki*. BULLOCK ORIOLE.— Taken at north end of the Hills by Grinnell; at Fort Pierre by Hayden, 1857. One seen at Rapid City, August 1. Five taken by Behrens June 14, 1899, etc.

117. *Euphagus cyanocephalus*. BREWER BLACKBIRD.*—Abundant breeder.
118. *Quiscalus quiscula seneus*. BRONZED GRACKLE.*—Common breeder in the Hills. Rare migrant in southwest Stanley County (Sweet).
119. *Hesperiphona vespertina*. EVENING GROSBEEK.—Taken by Townsend in 1824. Three taken by Behrens, January 1, 1905.
120. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Common breeder about Rapid City; feeding largely upon the aphid galls on the petioles of the leaves of the cottonwood.
121. *Leucosticte tephrocotis*. GRAY-CROWNED LEUCOSTICTE.—Tolerably common in winter. Taken by Behrens Nov. 10, 1900.
122. *Acanthis hornemanni exilipes*. HOARY REDPOLL.—Taken by Behrens.
123. *Acanthis linaria*. AMERICAN REDPOLL.—Taken: abundant in fall (Behrens).
124. *Astragalinus tristis*. GOLDFINCH.*—Tolerably common breeder.
125. *Spinus pinus*. PINE SISKIN.*—Two large flocks seen in the pines in the Hills.
126. *Plectrophenax nivalis*. SNOWFLAKE.*—Common in winter (Sweet).
127. *Calcarius lapponicus*. LAPLAND LONGSPUR.*—Abundant in winter (Sweet).
128. *Calcarius pictus*. SMITH LONGSPUR.—Common in summer in southwest Stanley County.
129. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.*—Abundant breeder on plains; rare resident.
130. *Rhynchophanes mccowni*. MCCOWN LONGSPUR.*—Breeds near Whitewood. Common in winter (Sweet).
131. *Poœcetes gramineus confinis*. WESTERN VESPER SPARROW.*—Black Hills (Hayden). Abundant in fall.
132. *Coturniculus bairdi*. BAIRD SPARROW.—Taken by Behrens, Sept. 1, 1900. Rare.
133. *Coturniculus savannarum bimaculatus*. WESTERN GRASSHOPPER SPARROW.*—Occasional, nesting on prairies about the Hills; common breeder in southwest Stanley County.
134. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.*—Common breeder.
135. *Zonotrichia querula*. HARRIS SPARROW.—Common migrant (Sweet).
136. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.*—Black Hills (Hayden).
137. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—White River (Hayden).
138. *Spizella monticola ochracea*. WESTERN TREE SPARROW.*—Common migrant (Sweet).
139. *Spizella passerina arizonæ*. WESTERN CHIPPING SPARROW.*—Tolerably common in summer.

140. *Spizella pallida*. CLAY-COLORED SPARROW.— Abundant in the Hills. Breeds.
141. *Spizella breweri*. BREWER SPARROW.— Male taken by Behrens, July, 1899. Rare.
142. *Junco hyemalis*. SLATE-COLORED JUNCO.— A pair taken by Behrens. Common migrant (Sweet).
143. *Junco aikenii*. WHITE-WINGED JUNCO.* — Abundant breeder in center of the Hills. Taken by Hayden.
144. *Junco phaeonotus caniceps*. GRAY-HEADED JUNCO.— Taken by Hayden and by Behrens. Seen in August, in the northern part of the Hills (Custer Peak).
145. *Melospiza melodia*. SONG SPARROW.* — Tolerably common breeder about the Hills.
146. *Melospiza georgiana*. SWAMP SPARROW.— Male taken by Behrens, June 14, 1899. Rare.
147. *Pipilo erythrophthalmus*. TOWHEE.— Once seen in summer. (Sweet).
148. *Pipilo maculatus*. ARCTIC TOWHEE.— Abundant breeder in cañons of the Hills.
149. *Zamelodia melanocephala*. BLACK-HEADED GROSBEEK.— One seen August 1 near Rapid. Taken by Hayden in the Bijou Hills east of the Missouri River. June and July (Behrens).
150. *Guiraca caerulea lazula*. WESTERN BLUE GROSBEEK.— Taken August, 1899, and September 2, 1900. Breeds (Behrens).
151. *Passerina cyanea*. INDIGO BUNTING.— Nests occasionally in the Hills (two broods August 4 near Blackhawk).
152. *Passerina amoena*. LAZULI BUNTING.* — Breeds near Fort Pierre (Hayden). Seen in Sanborn County (eastern part of State).
153. *Spiza americana*. DICKCISSEL.* — Tolerably common breeder, along White River.
154. *Calamospiza melanocorys*. LARK BUNTING.— Common breeder.
155. *Piranga ludoviciana*. LOUISIANA Tanager.* — Abundant breeder in the Hills.
156. *Progne subis*. PURPLE MARTIN.— Common in the Hills.
157. *Petrochelidon lunifrons*. CLIFF SWALLOW.* — Common breeder.
158. *Hirundo erythrogastra*. BARN SWALLOW.* — Common breeder.
159. *Tachycineta thalassina lepida*. VIOLET-GREEN SWALLOW.* — Tolerably common nester in the Hills.
160. *Riparia riparia*. BANK SWALLOW.— Tolerably common summer resident.
161. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.* — Rare summer visitor.
162. *Bombycilla garrula*. BOHEMIAN WAXWING.— Taken by Behrens, January to February, 1899. "The only winter when it was seen."
163. *Bombycilla cedrorum*. CEDAR WAXWING.— Common on the Missouri River (Grinnell).

164. *Lanius borealis*. NORTHERN SHRIKE.*—Common winter visitor (Sweet).

165. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.*—Abundant breeder in cottonwoods.

166. *Vireosylva gilva swainsoni*. WESTERN WARBLING VIREO.—Taken on Bear Butte (Grinnell). Nests frequently in Rapid City.

167. *Lanivireo solitarius plumbeus*. PLUMBEOUS VIREO.—Common at Harney Peak (Grinnell).

168. *Dendroica aestiva*. YELLOW WARBLER.*—Nests commonly about the Hills.

169. *Dendroica auduboni*. AUDUBON WARBLER.*—Seen frequently in the Hills; probably nests. Common spring migrant along White River (Sweet).

170. *Dendroica striata*. BLACK-POLL WARBLER.—Pair taken by Behrens.

171. *Geothlypis tolmiei*. MACGILLIVRAY WARBLER.—Taken by Hayden in the Hills. Occurs locally in low boggy woods in the higher Hills. A common nester. A migrant in Stanley County.

172. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.*—Common breeder.

173. *Icteria virens longicauda*. LONG-TAILED CHAT.*—Taken at mouth of White River and at Fort Pierre (Hayden). Seen in badlands in September.

174. *Setophaga ruticilla*. AMERICAN REDSTART.—Common breeder on White River (Sweet).

175. *Anthus pensilvanicus*. AMERICAN PIPIT.—Taken in the Black Hills in 1857 by Hayden.

176. *Anthus spraguei*. SPRAGUE PIPIT.—Common in summer (Sweet).

177. *Cinclus mexicanus unicolor*. AMERICAN DIPPER.—Two or three seen on each large mountain torrent.

178. *Oroscoptes montanus*. SAGE THRASHER.—Taken by Behrens, Nov. 12, 1900. Rare.

179. *Mimus polyglottos leucopterus*. WESTERN MOCKINGBIRD.—Taken by Hayden in 1860 in the Hills.

180. *Dumetella carolinensis*. CATBIRD.*—Rare in summer at Rapid; common in southwest Stanley County.

181. *Toxostoma rufum*. BROWN THRASHER.*—A common breeder along White River.

182. *Salpinctes obsoletus*. ROCK WREN.*—A very abundant and conspicuous breeder, on hog-backs of the rim of the Hills, and in the badlands, where it nests in crevices. The badland form is very pale in color.

183. *Thryomanes bewicki*. BEWICK WREN.—Taken by Behrens, August 1, 1899.

184. *Troglodytes aëdon parkmani*. WESTERN HOUSE WREN.—Common breeder along White River in Stanley County.

185. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.*—Common breeder in the Hills.

186. *Sitta canadensis*. RED-BELLIED NUTHATCH.— A common resident in the Hills.
187. *Penthestes atricapillus septentrionalis*. LONG-TAILED CHICKADEE.* — Abundant breeder.
188. *Myadestes townsendi*. TOWNSEND SOLITAIRE.— Taken by Hayden; abundant breeder about Custer Peak; young seen.
189. *Hylocichla mustelina*. WOOD THRUSH.— Common breeder at Fort Pierre (Hayden).
190. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.— Black Hills, 1857 (Hayden).
191. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.— Rare migrant (Sweet).
192. *Merula migratoria*. ROBIN.*— Rare summer visitant, except in a few foot-hill towns.
193. *Sialia sialis*. BLUEBIRD.— Nests at Rapid City. Common in summer (Sweet).
194. *Sialia currucoides*. MOUNTAIN BLUEBIRD.*— Very abundant (Grinnell). Only a few seen, in the Hills.

BARROW'S GOLDEN-EYE IN MASSACHUSETTS.

BY WILLIAM BREWSTER.

It is never very pleasant to admit mistakes that one has made, however pardonable they may appear. If the fact of their commission can be established only by elaborate argument, backed by evidence not perhaps wholly conclusive, the necessity for confession is doubly hard to face. Yet it is to precisely such a task as this that I now find myself committed. I came near undertaking it as far back as 1880 but I was not then prepared to discuss the matter effectively and it was afterwards forgotten. Now that it has again been brought to my attention I shall deal with it as briefly as possible.

Many years ago I reported in the 'American Naturalist'¹ that "an adult female" Golden-eye "pronounced by Prof. Baird" to be "unquestionably *B. Islandica*" had come into my possession "in the flesh from Cape Cod, December 7th, 1871" and that during

¹ Vol. VI, No. 5, May, 1872, pp. 306, 307.

the following winter I had "seen numbers of females and two fine adult males" of this species "in the Boston markets, most of them shot within state limits."

Our markets teemed with Golden-eyes that winter and I devoted a good deal of time to studying and comparing them. The game dealers said that most of them came from Cape Cod, but I learned afterwards that Montreal and Quebec were also rather frequent sources of supply; a fact which now leads me to doubt if any of the birds I saw in the markets at that time were certainly killed in Massachusetts, although the female that Prof. Baird examined was probably sent to me directly from Cape Cod as the wording of my published statement indicates. One of the adult males — still in my collection — was at first confidently believed to be a Massachusetts bird but on its present label, written in 1880, and in a catalogue entry, made that same year, the words "Cape Cod" are followed by a question mark. This specimen is a typical example of *islandica* as, no doubt, was the other male referred to in my record although I have now no distinct recollection of the latter, nor of what became of it.

Of the hundreds of female Golden-eyes which I saw in the markets in the winter of 1871-1872 a small proportion (not exceeding five per cent, if I remember rightly) differed from the others in having more or less orange or bright yellow on the bill (usually on the culmen just behind the nail) and an unbroken band of dull black dividing the white on the wing. Thinking that the birds thus marked might be Barrow's Golden-eyes I forwarded the head and wings of one of them to Prof. Baird. In a letter dated at Washington on December 13, 1871, he writes: "As far as I can judge by what you have just sent me of the remains, your bird is the female *Bucephala Islandica*. Our series of this is not very good, but I have little if any doubt of the correctness of this identification. Let me know if you wish me to return the head. If not I will make a skeleton of it." A week or two later I sent him the skin of the female afterwards recorded in the 'American Naturalist' as having been "obtained from Cape Cod, December 7th." Concerning it he wrote on December 29, 1871, as follows: "The Golden-eyed Duck is, I think, unquestionably, the *Islandica*, agreeing very well with the typical specimen in our collection; although the

orange spot [on the bill] appears to be common for this species, it is not entirely peculiar to it, since other kinds (*sic*) frequently possess it."

During the period when Prof. Baird was most actively engaged in studying and writing about North American birds many of them were represented in collections — even those of our larger museums, such as the Smithsonian Institution — by only a very few specimens and these, perhaps, too ill supplied with data, or in too poor condition to be of much value for scientific purposes. Hence he often had to deal with difficult problems in ornithology without the aid (now considered so indispensable) of adequate material for study and comparison. But his acumen in detecting slight or obscure characters and differences was so remarkable, and his judgment in deciding as to their value and signification so nearly unerring, that he made few positive mistakes, while most of his published opinions and deductions have so stood the test of time that they appear not less sound and convincing now than they did thirty or forty years ago. He was not infallible, however, and in respect to my Golden-eyes I fear he was at least partly in error. Unfortunately, neither of the specimens he saw is now available for examination. He probably kept the head but if so it does not seem to be in the Smithsonian Institution, for Dr. Richmond writes me under date of December 30, 1908: "I have searched our records and those in the osteological collection, and find only one head mentioned that may belong to the case referred to in your letter. This is a head catalogued by Mr. Ridgway in Nov., 1883, as '*Clangula americana* ♂ ad.,' the locality and donor said to be unknown.... I cannot find any record of this specimen having been catalogued between 1871 and 1872, or of any specimen received from you before about 1879."

What became of the skin I am unable to say definitely but I think it remained in my possession until 1880 when it may have been discarded with a number of other birds which I gave away or burned just before making a catalogue of my collection, in which this Golden-eye was not entered. Of course I should have kept it because of the fact that it had served as the basis of a published record, after having been identified by Prof. Baird, but it was in poor condition and before parting with it I had become satisfied

that it was not a Barrow's Golden-eye. Moreover, I then had—and have still, for that matter — other specimens almost exactly like it and I continue to see them in our markets. In my opinion all such birds should be referred to *americana*, despite the fact that some of them appear to approach rather closely to *islandica*.

The points of differences between the female of *islandica* and that of *americana* are still involved in no little doubt or obscurity. Few ornithologists seem to have given them much personal attention, and I know of but two whose published statements concerning them appear to have been based on a careful study of any considerable number of specimens. One of the authors is Mr. Ridgway. In Volume II of the 'Water Birds of North America,' published in 1884, he says (on page 42) that the females of the two species are "so much alike that, with the series at our command (about twenty specimens, including six unquestionably referable to *C. islandica*), we must acknowledge our inability to give infallible points of distinction. The examples which are known to represent *C. islandica* differ from the positively determined females of *C. glaucion* [*i. e.*, *americana*] in the following respects: (1) The color of the head and upper half of the neck is considerably darker, being a rich sepia- or snuff brown, rather than grayish brown; (2) the greater wing-coverts are distinctly tipped with black, forming a conspicuous dusky stripe between the two larger white areas of the wing, which in *C. glaucion* are (usually, at least) merged into one continuous space. Further than these we find no distinction, while indeed some examples are so decidedly intermediate in both respects as to render it quite uncertain to which species they belong. Of the two characters named, however, the color of the head is far the more constant, and may, perhaps, be found quite distinctive." To all this I fully agree although I doubt if the characters here discussed by Mr. Ridgway equal in value or constancy certain others of which he makes no mention in this connection.

The other author to whom I have just alluded is the late Dr. J. Bernard Gilpin. In a paper entitled 'The Golden Eyes, or Garrots in Nova Scotia,'¹ published more than thirty years ago, he has much of interest to say about the species *americana* and

¹ Transactions Nova Scotia Inst. Sci., Vol. IV, 1878, pp. 390-403.

islandica. He seems to have been familiar with them, living as well as dead, for he was accustomed to watch them swimming in pairs and small flocks in Digby Basin and to handle freshly killed specimens, apparently in some numbers. Hence his testimony regarding them is of importance and entitled to careful consideration. Without doubt it may be relied on as far as it relates to the adult males of the two species, concerning which he discovered that the trachea, bronchi and lower larynx of the one are very unlike those of the other; the difference being illustrated by a plate that accompanies his article. But his impressions respecting the females and immature males are, in my opinion, somewhat less trustworthy; indeed I cannot help suspecting that some of them were based on wrong identification of specimens. Thus he asserts — or at least plainly implies — that the female of *americana* is quite as likely as that of *islandica* to “have nearly the whole of the bill” yellow — which is contrary to my experience — and he is quite positive that the female of *islandica* sometimes possesses an entirely black bill — which I have never known to be the case. Nor can I agree with him in thinking “that the yellow is only as it were a transient mark of the young, and that the adults of both species have dark bills.” I should be equally unwilling to support the reverse of this proposition, however, since the presence or absence of bright yellow does not seem to me to be often if ever dependent on age. Dr. Gilpin’s final conclusions are given on page 398 of his paper in the following quaint but expressive language:— “Here then we have two species, in the male easily distinguished by colour, but in the female by colour impossible, and our only guide is that the Rocky Mountain bird [*islandica*], though larger, has a shorter and higher bill, and in consequence of this height a difference in the shape of the forehead, where the feathers meet the culmen, tolerably well enough shown in the male adults, but more obscurely in the females and young — all being in the recent state, and in the dried or mounted specimens scarcely discernible.” To this he adds (on page 399), “in the females as regards colour no difference can be found.”

Although Dr. Gilpin’s conclusions may be sound enough in the main I do not consider them perfectly satisfactory in so far as they apply to female birds. In dealing with these he was evidently

accustomed to consider only the size or shape of the bill as of importance for purposes of identification; Mr. Ridgway seems to have relied at first (*i. e.*, in 1884) solely on the color of the head and neck and on the presence or absence of a dark bar on the wing, as marks of distinction; but in both editions (published respectively in 1887 and 1896) of his 'Manual of North American Birds' he recognized additional characters by indicating briefly, without discussion, that in Barrow's Golden-eye the bill is shorter and more abruptly tapered, with a broader nail, and the gray band on the chest of the female broader, and usually deeper, than in the American Golden-eye. My own impression of the matter, based on the examination of a large number of American Golden-eye and of no less than eleven undoubted specimens¹ of Barrow's Golden-eye now in my collection, is that typical females of *islandica* are quite as unlike those of *americana* in color and markings as in the shape and proportions of the bill, and that the two birds may best be distinguished from one another by the following characters, most of which have been noted, of course, by previous authors.

Clangula islandica. Bill comparatively short and abruptly tapered, laterally as well as vertically; sometimes almost wholly yellow in color (except on the nail and cutting edges which are always (?) black), invariably (?) with more or less yellow on both mandibles near the tip. Brown of head and neck rich, dark sepia, often tinged with blackish or (slightly) with purplish. Ashy on chest broad and pronounced. Greater wing-covert usually (but not invariably) tipped with black which, as a rule, forms a practically continuous dark band dividing the white into two distinct areas.

Clangula clangula americana. Bill longer and less abruptly tapered, especially laterally, the reduction in width towards the tip being much less noticeable; both mandibles often unicolored, or nearly so, the color being for the most part brown varying with age (?) from light wood brown to very dark brown or blackish. Brown of head and neck lighter and commonly hair-brown or grayish umber. Ashy band on chest narrower and paler, sometimes almost wanting. White patch on wing often immaculate or only imperfectly divided by a line of disconnected dark spots on the tips of the greater coverts.

The decided reduction in the width of the bill of *islandica* near its tip is, I think, the best of all the distinctive characters, afforded

¹ With a single exception, all these birds were taken on the coast of Maine, in the months of January, February, March and April.

by the female of this species. The bill of *americana*, when viewed from above, has a very different appearance; being *much more typically duck-like* in shape. It rarely, if ever, shows any pure yellow except near the tip where there is sometimes a narrow bar of this color on the culmen, just behind the nail, with perhaps some indication of a corresponding marking on the lower mandible, also. The dark bar on the wing is much less often lacking in *islandica* than in *americana* but as it is not infrequently quite as conspicuous and perfect in the latter as in the former it possesses no great value as a diagnostic character.

Many writers have asserted that *islandica* is the larger of the two forms, especially with respect to its wing measurements. There is perhaps some average difference of this kind although the smallest bird of either kind in my collection is an adult female of *islandica* taken in June among the mountains of British Columbia. As to the difference in the width of the nail at the tip of the bill, to which Mr. Ridgway has called attention, I am unable to verify it.

If I were asked to restate the characters just formulated, placing them in the order of their relative importance, I should arrange them thus: (1) Shape and proportions of bill; (2) coloring of head and neck; (3) coloring of bill; (4) presence or absence of continuous dark band across white wing patch. When all the marks of distinction which I have attributed to one or the other species are possessed in *combination* by a single bird the identity of the specimen is open to no doubt, but unfortunately there is perhaps no one of them all which is invariably confined to the form of which it is ordinarily characteristic. Indeed, one cannot handle any considerable number of female Golden-eyes killed in winter in New England without coming upon specimens which are far from typical, while some of these are likely to be so nearly "half-way" intermediates between *americana* and *islandica* that their definite reference to either form is impracticable, except on purely arbitrary grounds. I used to suspect that such birds might be of hybrid origin but I now incline to the opinion that they represent nothing more nor less than a curiously one-sided transfer or borrowing of external characters which are not always constant. They fail, however, as far as I have observed, to furnish series perfectly connecting *americana* with *islandica*. Oddly enough the unfilled gap

lies not midway between the two species, as might be expected, but much the nearer to *islandica*. In other words *americana* seems to approach *islandica* very closely through birds possessing certain characteristics of the latter species, whereas *islandica* exhibits little or no tendency to appropriate any of the characters of *americana*. Or, to put the case still more definitely, if somewhat figuratively, *americana* may be said to have forged towards *islandica* a closely-welded chain, quite continuous up to the point where it abruptly terminates, just before reaching the narrowly circumscribed limits of the area occupied by *islandica*, a comparatively stable and immutable form. For although the birds which supply the links of this chain grade perfectly into typical *americana* on the one hand they do not seem ever to pass a definitely fixed point in their approaches to *islandica* on the other. Yet collectively they exhibit, more or less unmistakably, nearly all the characteristics of ultra-typical specimens of *islandica*. Because of these conditions it has been my custom, when identifying female Golden-eyes taken in America, to refer all specimens not typical—or nearly so—of *islandica* to *americana*. This practise may be somewhat arbitrary but it is at least consistent with the facts in the case, as I understand them. It is possible, of course, that my evidence is incomplete and that the missing links in the chain of approaching females to which I have called attention may yet be found. But if, as I am inclined to believe, they do not exist, how can their absence be explained? Before attempting to answer this question it may be well for me to say a few words about the variations that I have noted in male Golden-eyes of both kinds.

There is never any difficulty in separating the adult males of the two species. They are, indeed, so strikingly unlike that one can distinguish them almost at a glance, without direct comparison. The male of *islandica* seems subject to remarkably little variation of any obvious kind. The male of *americana* is less uniformly characterized. It occasionally has a bill shaped much like that of *islandica* or white cheek markings so elongated vertically as to somewhat resemble those of that species. Dr. Gilpin asserts that "both males have the violet wash in the green of the head" but I have never known it to be shown conspicuously by *americana*, nor to be other than conspicuous and widespread on the head of

islandica. All the other external characters appear to be quite constant. Perhaps the most important as well as interesting of them all is one which the late Dr. J. A. Jeffries was the first to bring to the notice of ornithologists. It concerns certain of the white and black scapular feathers. With these, as Dr. Jeffries says,¹ "the terminal part of the white breaks off, and leaves the black edges projecting beyond" in Barrow's Golden-eye, whereas "this breakage does not take place in the common Golden-eye." This curious difference has been shown with absolute uniformity in all the specimens that I have ever examined.

That the males, as well as the females, of *americana* tend to vary in the direction of *islandica*, whereas both sexes of the latter are almost wholly free from variability of a corresponding kind, is interesting and perhaps, also, significant — if we could but grasp the underlying meaning of the fact. The approaches shown by the adult males are, however, much less frequent and pronounced than those afforded by the females. Indeed, I have seen only a very few males of *americana* which were not typical in every essential particular, and I have yet to meet with one which could fairly be regarded as a "half-way" intermediate between that species and *islandica*.

Since the adult male of Barrow's Golden-eye differs from that of the common Golden-eye, not only in respect to pronounced and stable external character but in internal structure, also (as Dr. Gilpin has shown), it would seem to be beyond question that the two forms are specifically distinct. Nevertheless they may interbreed occasionally, as Ducks of other and less closely allied kinds are known to do. If the intermediate birds to which I have alluded were of both sexes and of infrequent occurrence it might be possible to regard them as hybrids or the progeny of hybrids and to explain their various peculiarities by the application of one or another of Mendel's interesting laws — as has been done so convincingly of late in case of certain aberrant Warblers belonging to the genus *Helminthophila*. But as they appear to be invariably females and by no means uncommon, and as interbreeding of whatever kind is not known to ever produce offspring exclusively of one sex — at

¹ Bull. N. O. C., V, No. 3, July, 1880, p. 189.

least among birds — it appears improbable, to say the least, that hybridity can have had much if anything to do with the present case. The theory of mutation, so much discussed of late, is perhaps worth considering in this connection for it may throw light on some of our present difficulties. It has been tested, I believe, chiefly if not solely by observations made on domesticated animals and cultivated plants. Some of these are said to have furnished proofs that elementary, yet strongly characterized and apparently stable, species may originate from other and more variable ones by what are termed “jumps” or “steps.” A striking example of this is given by Darwin who, it is now claimed, recognized some of the principles of mutation although he did not deal with them under that name. He says that “japanned” or “black-shouldered” Peacocks have appeared “suddenly in flocks of the common kind” and that they “propagate their kind quite truly,” constituting what is considered by good authority to be a “distinct and natural species.” Even more remarkable is his statement that they tend “at all times and in many places to reappear,” by which he means, apparently, that a long “jump” which gives immediate birth to a well marked form breeding true to type may be followed at rather frequent intervals by precisely similar “jumps,” with identically the same results. More recent observations, relating mainly to carefully controlled or fostered plants and animals, have seemed to confirm this surprising fact and to show further that there are species which throw off, thus abruptly, not only strongly characterized and constant forms, but also great numbers of less pronounced and stable ones. In other words mutations which yield no very important or lasting results appear to occur oftener than those which result in the establishment of what are known as good species.

Since these wonderful things are thought to take place among animals and plants under domestication why may they not happen — if less often — in untrammelled Nature? It has been inferred that they do so happen but the fact remains to be proved, I believe. If we might assume, as a mere tentative proposition, that *Clangula islandica* is a simple mutant of *americana*, resulting from a long “step” (or succession of “steps”) taken in the more or less remote

¹ Animals and Plants Under Domestication, New York, 2d ed., 1876, Vol. I, pp. 306, 307.

past, it would follow, as a matter of course, that the interesting approaches to the former species shown by certain aberrant specimens of the latter afford evidence that "steps" shorter and less decisive than that (or those) which produced *islandica* have been and continue to be, made by *americana*, in the same general direction.

Thus far, indeed, the so-called laws of mutation might be made to fit well with the facts and conditions of the case which we are considering. But if I understand these laws correctly they would fail to explain why the representatives of *americana* which approach *islandica* at all closely are invariably females. Nor do I know of any other theory which is not similarly disappointing in this respect.

In their 'Birds of Massachusetts' Messrs. Howe and Allen mention (on page 55) a male Barrow's Golden-eye "labeled January 27, 1879, in the mounted collection of the Boston Society of Natural History, which appears unrecorded" and which is supposed to have been taken at Ipswich. There would seem to be little or no doubt that this specimen is the same as that referred to briefly in one of my note books under date of "January 27, 1869" as "an adult ♂ shot at Ipswich, Mass. by E. C. Greenwood. Purchased of him by Dr. Brewer for B. S. N. H." If I am right in so thinking, the record is open to grave suspicion if, indeed, it be not quite valueless, for although Greenwood is not known to have resorted to dishonest practises of any kind during the earlier years of his career as a professional collector, he was convicted in 1884 of having supplied false data with a number of mounted birds which he had just sold to the curator of a certain museum in eastern Massachusetts.¹

Mr. Job has reported² that "a fine male" Barrow's Golden-eye sent to a Mr. Wood "to be mounted, in the autumn of (about) 1885," was shot in Plymouth. Dr. Townsend³ considers it "probable that a beautiful male in the collection of the Lawrence Natural History Society," said to have been "shot near Lynn, about 1877," is one and the same bird with that referred to by the late Dr. J. A. Jeffries in a manuscript "note written in March, 1878," as "shot off

¹ See Brewster, Auk I, No. 3, July, 1884, pp. 295-297.

² H. K. Job, Auk, XIII, No. 3, July, 1896, p. 202.

³ C. W. Townsend. Birds of Essex County, Mass. Memoirs Nutt. Orn. Club, III, 1905, p. 139.

Nahant this winter on authority of Tufts." No statement so brief could well be more satisfactorily attested; for A. M. Tufts, the Lynn taxidermist who died ten or a dozen years ago, was a perfectly reliable man and too familiar with both kinds of Golden-eyes to make any mistake with regard to a male of either species. Nor would there seem to be reason to question the Plymouth record, since Mr. Job puts faith in it.

There is still another Massachusetts record,¹ relating to Nantucket, where a male Barrow's Golden-eye "in the adult plumage" is said to have been taken on December 17, 1906. As this specimen was "destroyed in ignorance," before being seen by any one except a few native gunners, its subsequent identification on hearsay evidence, merely, cannot be regarded with much confidence.

The Museum of Comparative Zoölogy has just received by gift, from Mr. Matthew Luce of Boston, a fully adult male of Barrow's Golden-eye mounted by the M. Abbott Frazar Company. Concerning this bird Mr. Luce writes me, under date of December 22, 1908, as follows: "I shot the Barrow's Golden-eye on Friday morning, the 11th of December [1908] in the marsh known as Nauset Bay at Eastham, Mass. There were two others with this bird, a female which I secured, and another male, but whether the other male was a Barrow's or not, I could not tell. The female, I took to be a common Whistler. There was a light southwest wind with an occasional flurry of snow. I had decoys out and got a number of the ordinary Whistlers besides this Barrow's."

I feel peculiarly indebted to Mr. Luce for his kindness in thus enabling me to couple with the admission of errors committed in my youth respecting Barrow's Golden-eyes, this definite and obviously authentic record of the recent occurrence of the species in Massachusetts.

¹ Auk, XXV, No. 2, April, 1908, p. 217.

THE HABITAT GROUPS OF NORTH AMERICAN
BIRDS IN THE AMERICAN MUSEUM OF
NATURAL HISTORY.

BY J. A. ALLEN.

Plates I-IV.

METHODS of exhibition in museums of natural history have greatly changed during the last twenty years. Previously it was nearly the universal custom to mount birds as single specimens, on stands or perches, the well-known T-perch sufficing for all perching birds, and flat stands for terrestrial birds, with no attempt to illustrate their habits or natural surroundings.

The American Museum of Natural History, in New York City was the first museum in this country to depart radically from this time-honored method, by direction of its late President, Morris K. Jesup. Early in 1887, twelve groups, illustrating the nesting habits of as many species of our common birds, were placed on exhibition, the cost of their preparation having been generously contributed by the late Mrs. Robert L. Stuart, widow of a former president of the Museum.¹ The accessories for the groups were prepared by the late Mrs. E. R. Mogridge, of London and New York, whose admirable work at the South Kensington Museum had attracted Mr. Jesup's attention. Her methods of reproducing in facsimile the foliage and flowers that composed the principal accessories of these groups was known for a time only to Mrs. Mogridge and her brother, Mr. Mintern, who was her personal assistant in the work, but later she taught her methods to others, forming classes for this purpose, not only in New York but in other cities, where she was employed by different museums for the construction of similar groups. In this way the preparation of such exhibits was undertaken elsewhere, notably in Washington, Pittsburgh, Chicago, and Springfield (Mass.).

During the following ten or twelve years the number of bird groups at the American Museum increased to fifty or more. The

¹ Cf. Auk, IV, 1887, p. 271.

group method of exhibition was also extended to insects and to mammals, of which latter a number of groups illustrating the habits of species found near New York City were prepared.

Prior to 1893, the construction of the groups was directed by the late Jenness Richardson, Chief Taxidermist of the Museum, who not only designed them, but collected and assembled the materials.¹ Later, for some years, the work was carried on by his successor, Mr. John Rowley, whose skill as a preparator is widely recognized.

The first fifty bird groups illustrate the nesting habits and location of the nest of as many species of North American birds, mostly the common species, from Grebes to Thrushes. They include a few Hawks and Owls, and various water birds, among the latter a Labrador Duck group, containing five specimens of this rare and now extinct species.

The special subject of the present article is the new series of so-called 'Habitat Groups,' formally opened to the public on February 25, 1909, the occasion having been made a public function, under the patronage of Professor Henry Fairfield Osborn, President of the Museum, and Mr. John L. Cadwalader, one of the principal contributors to the 'North American Ornithological Fund,' a generous gift from a few members of the Museum which rendered possible the gathering and preparation of the material for these expensive groups. They number about twenty-five, and are constructed on a much larger scale and with a much broader purpose than the earlier groups mentioned above, they being intended to illustrate not only the nesting habits of the species shown, but also their haunts or 'habitats.' The area of these groups ranges from 60 to 160 square feet, to which is added a panoramic background, which in most cases merges insensibly into the group itself. The backgrounds are painted by skilful artists, generally from studies made at the actual site represented. They are thus, like the accessories among which the birds with their nests and eggs or young are grouped, accurate and realistic representations of the actual scenes in nature which the species had chosen as their nesting haunts. They thus possess a scenic and geographic value in addition to their ornithological interest. These landscapes naturally

¹ Cf. Auk, X, 1893, p. 307.

represent widely diversified types of country, since they include the famous Bird Rocks in the Gulf of St. Lawrence, several bird keys in the Bahamas, a cactus desert in Arizona, plains and badlands in the Middle West, alpine scenes in the Rocky Mountains, the Palisades and the Hackensack marshes near New York City, and other localities of special interest.

In connection with the recent formal opening of the Gallery of the Bird Hall, the Museum has issued a 'guide leaflet' to this series of 'habitat groups,'¹ containing a full-page half-tone illustration of each, from photographs, and a transcript of the descriptive group labels. On this brochure is largely based the following account of these notable groups, which form a striking feature of the Museum's recent remarkable progress in placing before the public attractive and instructive exhibits in many lines of research. They are here given in the order of sequence in the hall, beginning at the right (southeast corner of the gallery).

Summer Bird-life of Cobb's Island, Virginia. Background by Walter Cox. Birds by H. C. Denslow.—Cobb's Island, off the coast of Virginia, is a shell-strewn sand-bar, seven miles long and about the same distance from the mainland, and thus affords ideal conditions as a breeding resort for certain kinds of water birds, as Terns of different species, Black Skimmers, Oyster-catchers and Plovers, while the adjoining marshes on its western border are the favorite nesting places of the Clapper Rail.

This group contains 63 birds, representing seven species. The scene is a sandy beach, with oyster and other sea shells, interspersed with tufts of the coarse grass characteristic of such beaches. The background is a view looking seaward, the whole forming a well-blended shore scene. The Least Terns, which formerly bred here in thousands, and are introduced into the group, were practically exterminated some years since, when 1200 were killed in a single day for millinery purposes, and the island was nearly depopulated of bird life.

¹ The Habitat Groups of North American Birds in the American Museum of Natural History. By Frank M. Chapman, Curator of Ornithology. No. 26 of the Guide leaflets of the American Museum of Natural History. Edmund Otis Hovey, Editor. New York. Published by the Museum, February, 1909.—8vo, pp. 48, with colored frontispiece (Wild Turkey), and a half-tone illustration of each group, from photographs.

Duck Hawk on the Palisades. Background by Hobart Nichols. — The nest is on a shelf of a cliff, and contains down-covered young; one of the old birds is approaching the nest bearing in its talons a domestic pigeon. The locality is the western shore of the Hudson, at Englewood, New Jersey, and the outlook is northward from the 'Gorge,' overlooking the river.

August Bird-Life of the Hackensack Meadows. Background by Bruce Horsfall. Birds by E. W. Smith. — The locality is the marshes of the Hackensack River, near Little Ferry, New Jersey. The view is westward, across the marshes. Cattails, wild rice, reeds, sagittarias and other aquatic plants make up the foreground, which is enlivened by the rose-colored flowers of the marsh-mallow and the scarlet of cardinal flowers. The purpose of the group is to illustrate a night resort of Swallows, and the feeding grounds of Reedbirds, Red-winged Blackbirds, and other species which visit the marshes in large numbers to feed on the wild rice. The birds are perched on the cattails and wild rice, with rails and a pair of Wood Ducks in the immediate foreground.

Wild Turkey Group. Background by Bruce Horsfall. Birds by H. C. Denslow. — A pair of old birds with their brood of young, in an opening in a forest in the mountains of West Virginia.

Florida Great Blue Heron. Background by Bruce Horsfall. Birds by H. C. Denslow. — A group of adult birds and half-grown young in the tree-tops of a Florida heronry, with characteristic surroundings.

The Anhinga or Water Turkey. Background by Bruce Horsfall. — Nests with eggs, nests with young birds at different stages of growth, and several old birds of both sexes, with one swimming submerged in the foreground. The scene is a lake nearly enclosed with cypress and palmettoes, with a distant vista showing the characteristic scenery of the lake region near St. Lucie, Florida. 'Bonnets' (yellow pond-lilies) give color to the immediate foreground.

Sandhill Crane Group. Background by Bruce Horsfall. Birds by Herbert Lang. — A pair of birds, with their nest and eggs, in a water-filled depression on the Kissimmee Prairies, Florida; background, a broad view of the prairies; hammocks and palm trees in the distance.



DUCK HAWK ON THE PALISADES.



THE AMERICAN EGRET IN A SOUTH CAROLINA CYPRESS SWAMP.

Brown Pelican, Pelican Island, Florida. Background by Bruce Horsfall. Birds by E. W. Smith.—A large group, containing seven old birds, nine young in various stages of growth, and several nests with eggs, some placed on the ground, others in mangrove bushes. It illustrates the manner in which the young are fed with predigested food. The background shows numerous birds in the distance, in various positions, some of them sitting on their nests, others walking on the sandy beach or swimming in the water. The view is toward the low mainland shore, with palm trees as a prominent feature of the distant landscape.

The American Egret in a South Carolina Cypress Swamp. Background by Bruce Horsfall. Birds by Herbert Lang.—Several old birds in fine feather, with nests containing young in various stages of development, in moss-draped trees at a height of forty feet from the ground. The sketches for the landscape were made from the trees at this altitude, to secure the desired effect. A creek in the midview gives an opportunity for water and forest effects, which include Egrets perched in the nearer trees.

A Cactus Desert and its Bird-life. Background by Bruce Horsfall. Birds by H. C. Denslow.—The locality is near Tucson, Arizona. The birds introduced—about 50 specimens, representing 20 species—are those characteristic of a desert environment, and include the Western Mockingbird, Palmer Thrasher, Cactus Wren, Road-runner, Gambel and Scaled Quails, three species of Doves, the Texas Nighthawk, Vermilion Flycatcher, Arizona Crested Flycatcher, Gilded Flicker, Arizona Cardinal, House Finch, Black-throated Sparrow, Verdin, Phainopepla, and Plumbeous Gnatcatcher. The vegetation comprises a number of the most striking forms of cacti, with mesquites and acacias. The background is a typical desert scene, with the beautiful Santa Catalina Mountains in the distance.

California Condor Group. Background by Carlos Hittell.—The site is in Piru Cañon, Ventura County, California, and affords an opportunity for striking scenic effects in the background. The Condor is represented by a lone bird and a single egg.

Brandt Cormorant Group. Background by Carlos Hittell. Birds by Herbert Lang.—An assemblage of six adult birds, a nest with eggs, and three broods of young in different stages of growth.

The scene is a rocky islet off the coast of Monterey, California, a portion of which is here reproduced, with an ocean view for a background.

Summer Bird-life of an irrigated portion of the San Joaquin Valley, California. Background by Carlos Hittell. Birds by H. C. Denslow.—As the title implies, the site is an artificially flooded area on the San Joaquin River, which forms a resort for the nesting of a considerable variety of wading and swimming birds. The 15 species represented in the group, which has an area of 8 by 20 feet, include Avocets, Stilts, Killdeer Plovers, Black and Forster Terns, Black-crowned Night Herons, White-faced Glossy Ibises, Coots, Mallards, Cinnamon Teals, Pintail Ducks, Ruddy Ducks, and Fulvous Tree Ducks. The pools of water and aquatic plants merge effectively into the background. The view is westward, over marshes and fields, to the Coast Range, prominent in the distance.

A Flamingo Colony in the Bahamas. Background by L. A. Fuertes (birds) and Carlos Hittell (landscape). Birds by Herbert Lang.—Scene, a key in the Bahamas; theme, a Flamingo city. The size of the group is 8 by 20 feet, in which are placed 16 old birds, and 18 young birds of different ages, interspersed among a dozen or more of the close-set, raised mud nests and small mangrove bushes, so arranged that birds, nests and mangroves merge imperceptibly into the background of an immense colony of Flamingoes, the whole representing, with wonderful realism, an actual "Flamingo city." The pink color and the outlines of the birds gradually fade out in the distance. The sea and a distant green islet studded with palms form the horizon line, while a long file of flying birds stretching across the sky illustrates the manner of flight of these great ungainly but beautifully tinted creatures. The great variety of positions given to the birds are from photographs from life.

Boobies and Man-o'-War Birds. Background by Bruce Horsfall. Birds by Herbert Lang.—The locality is Cay Verde, a coral islet in the Bahamas, some two hundred and thirty miles southeast of Nassau. The common West Indian Booby and the graceful Man-o'-War Bird are well-represented by both young and adult birds, the former species nesting on the ground, the latter in dense growths of bushes ('sea-grape') and cactuses. The inflated





A KLAMATH LAKE BIRD COLONY.

throat-pouch, of a vivid red color, gives a grotesque effect to the otherwise somber colored male Man-o'-War Bird. The background shows a portion of the key, with its peculiar vegetation, combined with a sea view of unusual interest.

Golden Eagle Group.—The scene is in the badlands of Bate's Hole, Wyoming; the nest is on a shelf of a high cliff. A fine old bird and two eggs represent the species, with a striking badlands background of buttes and gorges.

A Klamath Lake Bird Colony. Background by Carlos Hittell. Birds by Herbert Lang.—Klamath Lake, on the California-Oregon boundary line, is a vast expanse of shallow water, broadly bordered with tulés and rushes, and studded with low small islets covered with vegetation similar to that of the shores. It is thus a favorite breeding resort for a great variety of water birds, among which are the White Pelican, the California and Ring-billed Gulls, Caspian Tern, Farallone Cormorant, Great Blue and Black-crowned Night Herons, Wild Geese, the Bufflehead and other species of Ducks. The birds shown in the group are the White Pelican (old birds and young, nests and eggs), the Western Gull, Caspian Tern (numerous individuals of each), and the Farallone Cormorant. The scene is a tulé island, with similar small islands in the immediate background, treeless hills beyond, and snow-capped, grand Mount Shasta in the distance.

Arctic-Alpine Bird-life in the Canadian Rockies. Background by Carl Rungius, from a sketch by L. A. Fuertes.—Scene, about fifteen miles north of Laggan, at the Ptarmigan Lakes. The birds represented are the White-tailed Ptarmigan and American Pipit (with nests and eggs of each species), and the Rosy Snow Finch or *Leucosticte*. The background portrays one of the most impressive views in the Canadian Rockies, it including Mounts Redoubt, Temple, Hungabee, Lefroy, and Victoria.

Sage Grouse Group. Background by Carlos Hittell. Birds by Herbert Lang.—Scene, sage-brush plains, Medicine Bow, Wyoming. Two old males and a female, in characteristic attitudes, and eggs; others are shown in the nearer portion of the sage-brush background; Elk Mountain and the Snowy Range in the distance.

Love-making of the Prairie Hen. Background by Bruce Horsfall. Birds by H. C. Denslow.—Seven old birds, the males attitudinizing,

the neck-tufts erect and the large orange-colored air-sacks inflated. Scene, prairies of western Nebraska, with an effective landscape.

Wild Goose Group. Background by Hobart Nichols. Birds by Herbert Lang.—At Crane Lake, Saskatchewan, near the line of the Canadian Pacific Railway, where water birds, both swimming and wading, assemble in great numbers to pass the nesting season. The site shown is the grassy border of the lake, with the lake and distant hills in the background. The group consists of a single pair of old birds and their brood of seven young, in a foreground of grass and coarse plants.

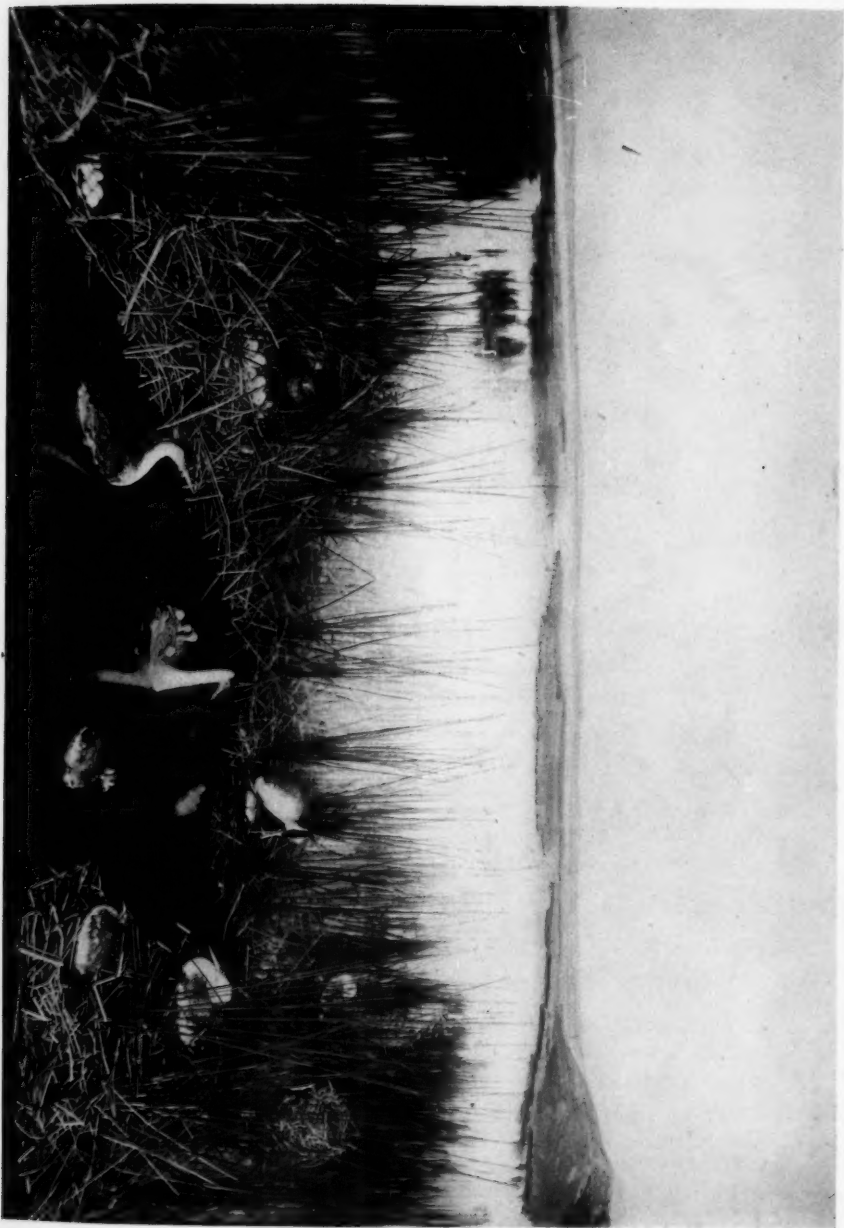
Grebe Group. Background by Hobart Nichols. Birds by Herbert Lang.—The studies here represented were also made at Crane Lake. The species are the Western Grebe and the Eared Grebe, several birds of each being shown, with nests of eggs and young birds. A female Redhead Duck, with her nest full of eggs, is introduced at the rear left corner. The site chosen is a grassy slough, with the lake and its numerous islets as a background.

Bird Rock Group. Birds by H. C. Denslow.—This is a realistic representation of a section of Bird Rock, in the Gulf of St. Lawrence, the long-famous breeding resort of the sea birds of that region. The group contains 73 birds, illustrating seven species. It was the first of the present series of large bird groups to be installed, and has already been described in this journal.¹ It is the only one of the series without a panoramic background, the cliff-like character of the group precluding such treatment.

In addition to the series of groups above described, another is nearly completed, representing a section of the famous Cuthbert Rookery in southern Florida, illustrating the habits of the Roseate Spoonbill, White Ibis, Snowy and American Egrets, Louisiana and Little Blue Herons. Among others planned to complete the series are groups illustrating the Turkey Buzzard, Whooping Crane, Loon, and Eider Duck, which will each afford the occasion for the introduction of additional scenic types in the backgrounds.

The production of this series of habitat groups has been a serious undertaking. It was work, in many ways, in new lines, where difficulties of many kinds were to be overcome, both in the field

¹ Auk, XX, 1903, p. 247.



GREBE GROUP.

and in the laboratory. The large degree of success that has attended the enterprise is due to the foresight, good judgment and enthusiasm of Mr. Frank M. Chapman, who during the last ten years has spent much of his time in gathering this unique material and superintending its preparation. Each group has been the product of a special expedition, the aggregate amount of travel entailed being estimated at about 65,000 miles. On all of the later expeditions Mr. Chapman took with him an artist and a preparator, and on all occasions the camera has played an essential part.¹ It has thus been possible to pose the birds in the groups after photographs of the living bird, unconscious of observation, taken from points of concealment devised to meet the occasion. The backgrounds have been painted, in nearly every case, by artists who have accompanied Mr. Chapman on these expeditions and have thus been able to paint the actual scene from nature which the groups illustrate.

In the foregoing list of the groups credit is given, in most instances, to both artist and preparator for their respective shares in the production of the groups,—the backgrounds and the mounted birds. The vegetation, however, forms an important element in their effectiveness, it having been reproduced in facsimile in wax, either from plaster casts of the parts represented or direct from the parts themselves. This feature of the work has been done under the direction of Mr. J. D. Figgins, Chief of the Department of Preparation at the Museum, and who has often accompanied the expeditions and taken charge of the plants and other field materials necessary to the perfection of the groups.

Difficulties were also encountered in the installation of the groups, in order to secure proper lighting and effectiveness of exhibition. In large plate glass case fronts, everything directly in range is reflected in the glass, to the more or less obscuration of the contents of the case. Experiments to overcome this effect were instituted by the Director of the Museum, Dr. Hermon C. Bumpus, and largely through his resourcefulness this difficulty, and others in the way of lighting the groups, have been effectively overcome. To quote

¹ See Mr. Chapman's recent book, 'Camps and Cruises of an Ornithologist,' where his field work during these expeditions is recounted, and where hundreds of his photographs are reproduced.

from Mr. Chapman's 'Guide Leaflet,' already cited: "Each group has demanded its own special treatment, and, in the construction of the series, the many novel problems encountered have resulted in the development of original methods. This is particularly true of the manner of installation and illumination of the groups at the sides of the hall The background is curved [convex backward] with the front opening so reduced in size that at the proper distance, or 'correct view-point,' neither the ends nor the top of the group can be seen. By thus leaving the actual limits of the group to the imagination the illusion of space and distance is greatly heightened." Furthermore, the groups are lighted from the top by diffused light; electric lighting is employed at night, or whenever the daylight is insufficient, but in either case the light comes from the same diffusing surface. The reflection of outside objects in the case fronts has been wholly prevented by the erection of a screen consisting of a low wooden partition placed at the inner edge of the gallery which serves not only to cut off reflections but tends to concentrate the attention of the observer upon the special and thus wholly isolated exhibit before him.

It is needless to say that the cost of this unique series of bird groups has been heavy, and the work could never have been undertaken by the Museum on the basis of its ordinary sources of income. It is therefore fitting to close this sketch with a list of the names of the friends of the Museum who have made these results possible, as follows:

Mr. JOHN L. CADWALADER.
Mrs. MORRIS K. JESUP.
Mrs. PHILIP SCHUYLER.
Mrs. JOHN B. TREVOR.
Mrs. ROBERT WINTHROP.
Mr. F. AUGUSTUS SCHERMERHORN.
Mr. H. B. HOLLINS.
Mr. HENRY CLAY PIERCE.
Mr. HENRY W. POOR.
Mr. COURTENAY BRANDRETH.

SOMETHING MORE ABOUT BLACK DUCKS.

BY WILLIAM BREWSTER.

THE 'Fourteenth Supplement to the American Ornithologists' Union Check-List of North American Birds,' published in a recent number of 'The Auk,'¹ contains the following announcement (p. 361): — "The name *Anas obscura* Gmelin, 1788, proves to be preoccupied by *Anas obscura* Pontoppidan, 1763, for an Old World species, and no other name being available, *rubripes* of Brewster is adopted as a substitute. (Richmond, MS.) There is some question as to the validity of the form recognized as No. 133a [*i. e.*, *Anas obscura rubripes*] which, by the above action, is now cancelled."

I am told that the closing sentence of the passage just quoted has been very generally understood to imply that, in the opinion of the A. O. U. Committee, it is no longer desirable to recognize more than one northern form of the Black Duck. Its wording would certainly seem to justify such an interpretation, especially as "133a, *Anas obscura rubripes* Brewster" is mentioned elsewhere in this same supplement (p. 352) in a list of "Eliminations," with the remark that it is "equivalent to No. 133," *i. e.*, to *Anas obscura* of the Check-List. As a matter of fact, however, the status of *rubripes* has not been passed on, nor even, I think, reconsidered, by the Committee since the form was accepted as a valid subspecies and given a place in our Check-List. I make this statement advisedly, after confirming my personal recollection of the history of the case by questioning the chairman of the Committee, Dr. Allen, and the Secretary, Dr. Richmond, regarding it. Dr. Allen writes me (under date of December 21, 1908) that "the Committee simply took *rubripes* as the only available name for the Black Duck group, without ruling on the status of *rubripes* as a subspecies of *obscura*, leaving a name for the Green-legged Black Duck to be provided for, presumably by you." I have heard from Dr. Richmond, also, to the effect that no action has been taken at any recent meeting of the Committee respecting the status of the form *rubripes*.

¹ Vol. XXV, No. 3, July, 1908, pp. 343-399.

It is truly deplorable that the Black Duck of our New England and Middle States, the *Anas obscura* of Gmelin, should have to relinquish the appropriate and familiar name which it has borne unchanged, and unaccompanied by a single synonym, for more than one hundred years. There is no other alternative, however, at least from the view point of ornithologists who take Linnaeus at 1756 instead of 1766 and who also subscribe to the maxim "Once a synonym always a synonym." Since the unfortunate bird is now left without any specific scientific title I propose that it be hereafter known as *tristis*, partly because of its subdued coloring but also to commemorate the sad fate it has been called upon to suffer at the hands of authorities on nomenclature. If this name be not preoccupied in Anatidæ (one can never be absolutely sure in respect to such a matter), the two more northern forms of the Black Duck group will stand, respectively, as follows:—

Anas rubripes Brewster. RED-LEGGED BLACK DUCK.

Anas rubripes tristis Brewster. BLACK DUCK.

It must be admitted that it seems very like adding insult to injury to thus relegate it to a subordinate place in the group where it has long stood at the very head, a bird which has just been robbed of an ancestral and time-honored name. Nor does this arrangement meet with the approval of all my scientific friends. Two of those whom I have consulted about it—both eminent zoölogists for whose opinion on such a matter I have the highest respect—hold that as the *Anas obscura* of Gmelin was, as far as we know, the first form of Black Duck to be recognized and described by ornithologists it should continue to be regarded as the original or "parent" form and that *rubripes*, which has been separated from it only very recently, should bear the trinomial appellation and take second place. This view appeals to me strongly. Indeed, it seems so logical and so obviously based on sound scientific principle that I have been tempted to adopt and act on it. But there is a practical consideration entitled, evidently, to still greater weight which Mr. Witmer Stone has expressed in the following words, contained in a letter that he has just written me:—"The whole thing comes down to a realization of the fact that we cannot represent more than one thing in our technical nomenclature and that is the *earliest name* for the form according to our Code. Evolution and history have

to be looked after in some other way." In other words the question is not so much one of principle — scientific or otherwise — as of expediency and of accepted usage. It will not do for those of us who have tacitly agreed to abide by the rules laid down in our Code, to disregard them when, as must occasionally happen, they run counter to our personal convictions or preferences. Canon XXIX of the Code (Canon XXV of the revised edition) provides that "when a species is separated into subspecies, or when species previously supposed to be distinct are found to intergrade, the earliest name applied to any form of the group shall be the specific name of the whole group." In the Black Duck group, as represented by its two more northern-ranging forms, we have now two names, and two only, to consider, *rubripes* 1902 and *tristis* 1909. As *rubripes* is clearly the earlier of the two it must become the specific name for this portion of the group. With *obscura* we have nothing further to do since it cannot again be used for any North American Duck in the genus *Anas*.

Under happier auspices I should have welcomed the chance of suggesting a name for the Black Duck. To have won the right to do so by being the first ornithologist to differentiate and describe so fine a bird would have been just cause for honest pride. But merely to replace a long-established name by a new and hence unfamiliar one is but an empty honor, in which I take no satisfaction. Indeed, I should not have cared to meddle in the matter at all had it not been for the purpose of correcting the misapprehension that has arisen respecting the present attitude of the Committee with regard to *rubripes*. For this form I am in a way responsible — as its original describer. I believe too strongly that it is a good subspecies to be willing to have it neglected or overlooked because of any confusion or misunderstanding due to the somewhat changed application of its name. That the characters which I have ascribed to it are presented by great numbers of specimens, and that with many of these they are so pronounced as to be easily recognized at gun-shot distance in living birds — especially when seen on wing — no one at all familiar with them seems able to deny. But there are a few ornithologists and sportsmen, I understand, who maintain — or at least suspect — that they are age or sexual characteristics, having no racial significance. Among these men,

apparently, is Dr. Townsend, who, in the 'Birds of Essex County, Massachusetts' ¹ has much of interest to say about *rubripes*. His testimony impresses me as being confirmatory, in the main, of the conclusions which I have reached regarding this form, although to his mind it seems to have a somewhat opposite bearing. While avoiding any definite expressions of belief he suggests "for the sake of argument, that *rubripes* is merely the adult male of *obscura*." I was inclined at first to entertain this theory but it was promptly discarded when the opportunity (mentioned ² in connection with my original description of *rubripes*) occurred of comparing the skins of six fully mature, breeding Black Ducks (in the Collection of Mr. Batchelder) from Newfoundland with four from regions bordering on Hudson Bay. For I found that all the Newfoundland specimens were essentially typical of the form then known as *obscura*, although one of them was an adult male, whereas the other four birds were equally good representatives of the form that I named *rubripes*, although two of them were females. In view of these facts (to which Dr. Townsend does not allude), and of the apparent absence of any counter evidence of a similarly definite kind, I feel justified in maintaining that at present there would seem to be no good reasons for doubting that the large Black Duck with coral red legs, bright yellow bill and spotted throat, which I have called *rubripes*, is subspecifically distinct from the bird hitherto known as *obscura*. Nor am I likely to relinquish this conviction until it has been shown to be untenable. If this is ever accomplished it must be either by observation of living birds, reared in confinement from their early youth to full maturity, or by further study and comparison of specimens collected at the height of the breeding season in definitely known localities. For the examination of any number of Black Ducks of miscellaneous and uncertain ages, shot in autumn and winter in regions where they assemble and intermingle at this time of year after having migrated from unknown summer haunts, is unlikely to ever prove anything conclusively beyond the fact — which I have freely admitted from the first — that *rubripes* and *tristis* intergrade. Were it not so they would be distinct species, which I have neither asserted nor believed.

¹ Memoirs Nutt. Orn. Club III, 1905, pp. 125-128.

² Auk, XIX, April, 1902, p. 187.

Just as eels are said to have become reconciled to being skinned alive, so most ornithologists are learning, I suspect, to regard with resignation or indifference, not unmingled with disgust, the ever-increasing and apparently quite hopeless instability of their technical nomenclature. Fortunately there are the English names of birds to which one may turn with blessed sense of relief because of their comparatively fixed and stable character. For they have changed but little since the days of Wilson and Audubon, although purists have not failed to suggest that they should be critically looked into and perhaps extensively emended. Heaven forbid that this ever come to pass! It would mean universal chaos in ornithological nomenclature. Surely we have enough of trial and tribulation to bear with this ceaseless tinkering of the scientific names. They stand, of course, on a different basis from the others, being governed by a complicated system of laws and traditions to which we have so bound ourselves that we must support and enforce them unflinchingly, though the skies fall. For this state of affairs, indeed, there would seem to be no help despite the nomenclatural tragedies which continue to follow one another in dreary and endless succession. Among these there has perhaps been no recent case sadder to contemplate than that afforded by the Black Ducks. Nor is the rearrangement of names in this group which I have just proposed certain to prove final. It might be overthrown, for example, by the discovery that the Florida Duck or the Mottled Duck intergrades with one or the other of the two more northern forms. If this possibility should ever develop into an established fact it would become necessary to treat three of these birds as subspecies of the fourth which would be the Florida Duck, *Anas fulvigula*, for its name dates back to 1874, and hence is older than those of any of the others.

NEW RECORDS AND IMPORTANT RANGE EXTENSIONS OF COLORADO BIRDS.

BY MERRITT CARY, U. S. BIOLOGICAL SURVEY.

THE notes relative to distribution of Colorado birds gathered for the Biological Survey during the field seasons of 1905-06-07, in connection with work on the life zones of that State, contain important geographical or vertical extensions of the known ranges of at least 34 species and subspecies. Moreover, two other species have been found for the first time within the State.

At the request of Dr. C. Hart Merriam, chief of the Biological Survey, these are now placed on record.

***Mergus serrator*.** RED-BREADED MERGANSER.—A mounted specimen was seen in the Estes drug store at La Veta in May, 1907. Mr. E. W. Scott, the owner, stated that it had been shot on a reservoir near the town.

***Egretta candidissima*.** SNOWY HERON.—Although occasionally reported from both sides of the mountains, the following two specimens seem worth recording. While in the White River region in 1906 I learned on reliable authority that a Snowy Heron had been killed near White River P. O. the previous summer, being afterward mounted at Meeker. A mounted specimen seen in the Estes drug store at La Veta in May, 1907, is said to have been killed in that vicinity. The altitude of La Veta, 7000 feet, is exceptionally high for this species.

***Helodromas solitarius cinnamomeus*.** WESTERN SOLITARY SANDPIPER.—A pair seen on Deer Creek, 10 miles north of Kremmling, Middle Park, July 13, 1905, may have been on their breeding grounds.

***Bartramia longicauda*.** BARTRAMIAN SANDPIPER.—This plover is possibly of more general occurrence in western Colorado than has been supposed. Migrating birds were heard at our camp on Bear River, south of Lay, Routt County, the night of August 6, 1905, and others were heard in migration at Meeker on several occasions between August 9 and 14, usually after nightfall. Two were also seen on a meadow near Meeker, August 12.

A lone Bartramian Sandpiper seen August 9, 1907, on a timothy stubble at the head of Smith Fork, in the West Elk Mountains, apparently had become separated from a flock of migrating birds, as it was bewildered, and remarkably tame. The altitude was unusual for *Bartramia*, being over 7000 feet, while the record is the most southwestern for the State.

***Lophortyx californicus*.** CALIFORNIA PARTRIDGE.—From Grand Junction, where first introduced, this quail has spread up the Gunnison Valley at least to Hotchkiss, where it was found in abundance in August, 1907.

Also introduced successfully at Mancos, and spreading to quite an extent in Montezuma County. One was seen among the piñons two miles south of Dolores, June 25, 1907, by Mr. R. S. Philips of the U. S. Forest Service.

Tympanuchus pallidicinctus. LESSER PRAIRIE HEN.—The few Prairie Chickens reported in the sandhills of southeastern Baca County, between Springfield and the Cimarron River, should be *pallidicinctus*. Unfortunately, while in this region in November, 1907, I was unable to secure specimens.

Pedioecetes phasianellus columbianus. COLUMBIAN SHARP-TAILED GROUSE.—A specimen of *columbianus* taken near Hahn's Peak in August, 1906, proves quite conclusively the identity of the Sharp-tailed Grouse of northwestern Colorado, and suggests also the probability that all the grouse west of the Continental Divide are this form rather than *campestris*. These grouse were tolerably common in the sage parks between Hahn's Peak and Slater, in both Canadian and Transition zones. Several family parties were encountered, the young being nearly two-thirds grown on August 15.

In 1907, Sharp-tailed Grouse were reported tolerably common on both the northern and southern slopes of the San Miguel Mountains, and in the Lone Mesa region of Dolores County, chiefly above the piñon belt. I flushed one at 9000 feet in the open, park-like country three miles southeast of Lone Mesa, June 27, and another in the oak country eight miles south of Norwood, San Miguel County, July 27. On the slopes of Lone Cone the breeding range is in the partially open oak and aspen country between 8000 and 9500 feet. According to Mr. C. H. Smith of Coventry, it is only during the severest winter months that Sharp-tailed Grouse occur as low as 6500 feet. These grouse were also reported the same year from the upper part of the yellow pine belt near Pagosa Springs, and a very few from the scattered sage parks lying between the McElmo Cañon, Montezuma County, and the Abajo Mountains, Utah.

The known southwestern range of *columbianus* is thus considerably extended.

Otus flammeola. FLAMMULATED SCREECH OWL.—A mounted specimen of this rare little owl was seen in a taxidermist's establishment at Glenwood Springs in August, 1905, but its source could not be ascertained.

Geococcyx californianus. ROAD-RUNNER.—Abundant in the cedar country of northwestern Baca County, a male specimen being collected at Gaume's Ranch in November, 1907. The northeastern limit of range is at the Rhinehart Stage Station, 22 miles south of Lamar on the Lamar-Springfield stage line, at which point Road-runners are said to be seen occasionally.

Aëronautus melanoleucus. WHITE-THROATED SWIFT.—Henderson mentions the occurrence of this species at Pawnee Buttes, in northeastern Weld County, which is the most northeastern record for Colorado. I have, however, found it in abundance at Sheep Mountain, Big Bad Lands, South Dakota, September 2, 1905, apparently at the limit of its dispersion to the northeast.

Tyrannus tyrannus. KINGBIRD.—Not uncommon in northwestern Colorado, at least during migration. Noted as follows: Meeker, early August, 1905; Dixon, Wyoming, August 22, 1906; Snake River, 20 miles west of Baggs Crossing, August 22 to 27, 1906; 7 miles west of Rifle, August 14, 1907; Edwards Sheep Camp, east of Sunny Peak, Routt County, August 28, 1906. This last is the most western record in Colorado.

Aphelocoma woodhousei. WOODHOUSE JAY.—Troops of Woodhouse Jays were often encountered in the dense growth of cedars (*Juniperus monosperma*) near Gaume's Ranch, in extreme northwestern Baca County, November 26 to 29, 1907, and it seems likely that they winter in that region. This is the most eastern Colorado record.

Cyanocephalus cyanocephalus. PIÑON JAY.—Tolerably common in the rough cedar country of northwestern Baca County, November 26 to 29, 1907. Not known to breed, and probably present only as a winter resident.

Astragalinus psaltria. ARKANSAS GOLDFINCH.—North in western Colorado to Meeker and Steamboat Springs, at which localities it was common early in August, 1905.

Junco aikenii. WHITE-WINGED JUNCO.—Although the commonest junco in the mountains in winter, *aikenii* has not been found in Colorado, heretofore, in the breeding season. During the first few days of June, 1905, I saw several of these juncos in the foothills a few miles west of Boulder, at altitudes varying from 6000 to 7000 feet. On June 11, Mr. Walter Blanchard of Boulder showed me a nest containing young, from which the female was flushed and satisfactorily identified, though unfortunately not secured. This was in the upper part of the yellow pine belt a mile north-east of Magnolia, at an elevation of approximately 7000 feet.

In fall migration *aikenii* extends eastward in the rough cedar country of southeastern Colorado nearly to the Kansas line, a large flock being seen November 27, 1907, at Gaume's Ranch, in Shell Rock Cañon, northwestern Baca County.

Junco hyemalis montanus. MONTANA JUNCO.—In Colorado this is one of the most widely distributed juncos in winter. An extreme eastern record is Gaume's Ranch, northwestern Baca County, where several were seen and one collected on November 27, 1907.

Melospiza georgiana. SWAMP SPARROW.—One taken October 23, 1907, on the Medano Springs Ranch, in the San Luis Valley, 15 miles northeast of Mosca, is the first record west of the mountains, and the second time the Swamp Sparrow has been found in the State. The specimen was caught in a trap set for mice on the edge of a tulé marsh.

Pipilo fuscus mesoleucus. CAÑON TOWHEE.—Occurs commonly in Upper Sonoran zone in all of the region lying south of the Arkansas River and east of the Sangre de Cristo Range, except on the treeless plains of southern Prowers and eastern Baca counties. Very abundant in Shell Rock Cañon, northwestern Baca County, November 26 to 29, 1907, two specimens being collected at Gaume's Ranch; also noted at Caddoa Station,

in the Arkansas Valley west of Lamar, November 30. Gaume's Ranch is very near the eastern limit of its dispersion in Colorado, while Caddoa represents the extreme northeastern limit of *mesoleucus* in the United States.

***Calamospiza melanocorys*.** LARK BUNTING.—A belated migrant was noted a few miles east of Saguache, in the San Luis Valley, November 7, 1907.

***Progne subis*.** PURPLE MARTIN.—Unusually high records for the martin are: White River Plateau (25 miles southeast of Meeker) between 8000 and 9000 feet—several seen the middle of August, 1905; and Uncompahgre Butte, on the Uncompahgre Plateau—one noted at 9000 feet, July 16, 1907.

***Lanius borealis*.** NORTHERN SHRIKE.—One seen from a Santa Fé train at Earl, Las Animas County, November 25, 1907, and several a few days later at Gaume's Ranch, in the northwest corner of Baca County. These localities indicate a southward dispersion in winter nearly if not quite to the southern line of the State.

***Lanivireo solitarius cassini*.** CASSIN VIREO.—A specimen was collected September 4, 1906, at Douglas Spring, in the cedar belt at the north base of the Escalante Hills, western Routt County, and two more were heard at the same locality on September 6. A large vireo, presumably *cassini*, was also seen among the piñons at Coventry, Montrose County, in July, 1907.

***Dendroica graciae*.** GRACE WARBLER.—Tolerably common in the yellow pine forests of Archuleta County, on the headwaters of the San Juan River, at about 7000 feet, a specimen being taken at Pagosa Springs, May 28, 1907. A very active warbler, almost continually in motion, appearing in nervous haste to catch the small insects which infest the terminal bunches of pine needles.

***Dendroica nigrescens*.** BLACK-THROATED GRAY WARBLER.—This warbler extends north in the cedar and piñon country of western Colorado to the Escalante Hills, western Routt County, where several were seen at Douglas Spring, September 4 to 8, 1906. In 1907—Mesa Verde, Montezuma County (7000 feet), common June 14; Sinbad Valley, southwestern Mesa County, common in July; Coventry, a few during July and an immature specimen collected July 25.

***Dendroica townsendi*.** TOWNSEND WARBLER.—A male shot August 24, 1906, on Snake River, 20 miles west of Baggs Crossing, was on its southward migration with a large company of Pileolated and Yellow Warblers.

***Geothlypis trichas occidentalis*.** WESTERN YELLOW-THROAT.—One was seen July 12, 1905, in a willow copse along Grand River, 5 miles east of Sulphur Springs, Middle Park. The elevation, nearly 8000 feet, is exceptionally high for the Yellow-throat.

***Setophaga ruticilla*.** REDSTART.—A few migrating individuals were noted in a large company of Pileolated Warblers on the lower Snake River, 20 miles west of Baggs Crossing, August 25 to 27, 1906.

Catherpes mexicanus conspersus. CAÑON WREN.—Noted at various points in western Colorado in 1906-07, chiefly south of the Grand River Valley. North (sparingly) to the lower White River Valley, indicated by one which was heard among the rock ledges 20 miles east of Rangely, September 12, 1906. The most eastern Colorado record for the cañon wren is Gaume's Ranch, northwest Baca County, where a specimen was collected in Shell Rock Cañon, November 27, 1907. Mr. E. J. Gaume states that this wren is a regular breeder in the cliffs near his ranch. The above locality is also important as marking the eastern limit of *conspersus* north of Texas.

Thryomanes bewicki bairdi. BAIRD WREN.—A not uncommon summer resident in the piñon and cedar country of western Colorado. The northernmost record for the State is Elk Springs, on the piñon divide eight miles south of Lily, Routt County, where one was seen September 11, 1906. Two others were noted and one collected southwest of Rangely, Rio Blanco County, on September 17.

Thryomanes bewicki cryptus. TEXAN WREN.—A Bewick Wren was seen among the cedars on the south rim of Shell Rock Cañon, near Gaume's Ranch, Baca County, November 27, 1907. Though the specimen was not secured, it undoubtedly belonged to this recently separated plains race, rather than to *bairdi* of the mountain region, and is thus the first Colorado record for *cryptus*.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—One shot October 23, 1907, in a rank growth of marsh grass on the Medano Springs Ranch, 15 miles northeast of Mosca, is not only the first record for *stellaris* in the San Luis Valley, and west of the mountains, but also for the State. Another individual was seen in a neighboring tulé marsh the following day, in company with a large number of tulé wrens. Although the San Luis Valley is far removed from the known range of *stellaris*, it seems not unlikely that thorough work in the tulé marshes lying along the west base of the Sangre de Cristo Range may reveal it as an occasional summer resident.

Sitta pygmaea. PYGMY NUTHATCH.—Noted July 14, 1907, among the yellow pines at the head of Dominguez Creek, on the northern end of the Uncompahgre Plateau,—altitude about 8000 feet. The first Mesa County record for *pygmaea*.

Baeolophus inornatus griseus. GRAY TITMOUSE.—At a number of points in the Upper Sonoran zone of western Colorado in 1906-07, chiefly below 7000 feet. North to the Escalante Hills of Routt County, where common September 4 to 8, 1906—a specimen being taken September 4.

Psaltiriparus plumbeus. LEAD-COLORED BUSH-TIT.—The following localities indicate a wide distribution in the cedar and piñon country of western and southwestern Colorado: Escalante Hills, flock of 30 near Douglas Spring, September 4, 1906, two collected; Coventry, small flock, July, 1907; Mesa Verde, 25 miles southwest of Mancos, small flock, June 14, 1907, at 7000 feet; Arboles, small flock, June 8, 1907.

Poliophtila caerulea obscura. WESTERN GNATCATCHER.—Not known

from north of Grand Junction, and breeding only in the hottest desert valleys. Tolerably common and one taken among the cedars in dry gulches along the McElmo Cañon, Montezuma County, in June, 1907, and again in July among oak thickets in Sinbad Valley and along Dolores River, in southwestern Mesa County. One also seen May 21, 1907, at Walsenburg, east of the mountains.

Myadestes townsendi. TOWNSEND SOLITAIRE.—A nest containing four partially incubated eggs, found July 27, 1906, at 6200 feet in the foothills a few miles southwest of Arkins, Larimer County, was nearly 2000 feet lower than the normal breeding range of the Solitaire in Colorado. The writer has, however, found this species breeding at considerably below 5000 feet in the Pine Ridge region of northwest Nebraska.¹

Solitaires were abundant in the cedar country of northwest Baca County, November 26 to 29, 1907, where they doubtless winter.

Sialia mexicana bairdi. CHESTNUT-BACKED BLUEBIRD.—One seen in July, 1907, near Uncompahgre Butte, on the Uncompahgre Plateau, at 9000 feet, is the first record of *bairdi* in Mesa County.

Sialia currucoides. MOUNTAIN BLUEBIRD.—Common at Springfield and Gaume's Ranch, Baca County, November 25 to 29, 1907, where reported wintering.

GENERAL NOTES.

A Recent Instance of the Occurrence of the White Pelican (*Pelecanus erythrorhynchos*) in Massachusetts.—I have an adult male White Pelican, in full nuptial plumage with well-developed 'centre-board,' which Dr. Lombard C. Jones of Malden, Massachusetts, was kind enough to secure for me some four years ago, soon after it had been skinned and mounted by Robert Bazin, a Malden taxidermist. It was taken at Sandwich, Massachusetts, possibly on the 12th, but almost certainly on the 13th, of May, 1905, by George W. Kuntz (or Kounze) of Sandwich. He gave it to Eugene Haines (also of Sandwich and familiarly known to Dr. Jones) who sent it in the flesh to Dr. Jones by whom it was received on May 17 and immediately placed in the hands of the taxidermist already mentioned. I bought it a week or two later from Mr. Haines, through Dr. Jones, and it was deposited in my collection on May 31, while the skin was still 'green' and enshrouded in its winding of cotton thread. Mr. Haines reported that Mr. Kuntz (or Kounze) had found the bird lying dead among some beach grass whence he traced its large footprints backward across the beach to the water's edge; here it must either have alighted or — as is perhaps more probable —

¹ See Proc. Nebr. Ornith. Union, II, 1901, 79; also *ibid.*, III, 1902, 73.

swam ashore, before seeking the slight shelter afforded by the spot which came so near being its final resting place. These data are all attested by letters and other memoranda received by my assistant, Mr. Walter Deane, in May and June, 1905, from Dr. Jones, who appears to have had most of his information from Mr. Haines. There is a newspaper clipping, however, pasted in one of the letters and inscribed (evidently by Mr. Deane) "Boston Post, 1905," which reads as follows:—"Pelican found at Sandwich. Sandwich, May 17.—A strange sight was witnessed here on Friday, when a large pelican was found on the beach here by Mr. Kounze, who gave it to Eugene Haines. It measured 8 feet from tip to tip of its strong wings. Its bill was over 18 inches long, and the pouch underneath would hold two or three gallons. Whether it followed some other birds from its far-away home, or whether it was blown towards these shores in a hurricane, none can tell. Mr. Haines will have it mounted and placed on exhibition."

This brief note is, as far as I am able to learn, the only published record that has hitherto appeared of the bird to which it relates. It will be observed that the name of the man who found the Pelican was here printed "Kounze," not "Kuntz," as it is written by Dr. Jones; while it is necessary to point out further that the "Friday" immediately preceding May 17, 1905, fell, according to the calendar for that year, on May 12, instead of on the 13th, which Dr. Jones regards as the correct date. As he is careful to express doubt in one of his letters concerning the accuracy of his spelling of the name, that given by the Sandwich correspondent of the 'Post' is perhaps to be preferred; but with respect to the date, Dr. Jones is, without question, the better authority of the two. He has just written me (February 23, 1909): "I am sure you will make no mistake in accepting the data which I obtained at the time, in accordance with the request of Mr. Deane, for I certainly fixed the date then as accurately as possible...and the evidence I obtained was from Mr. Haines to whom the bird was given by the finder." — WILLIAM BREWSTER, Cambridge, Mass.

The European Widgeon in Rhode Island.—Almost any large collection of birds is likely to yield occasional surprises in the way of rarities which have been previously misidentified or overlooked. An instance of this happened only a few weeks ago when I found in my series of American Widgeon a peculiarly colored specimen, labeled *Anas americana*, which I do not remember to have ever noticed before. My record books show that it was purchased, with a number of other birds, in 1896, from Mr. Edward Sturtevant of Newport, Rhode Island, and that one of my assistants catalogued and relabeled it with the others, possibly when I was absent from Cambridge. Its original label, still attached to the skin, reads as follows:—"♂ *Dafila acuta*, 22, Rhode Island, Middletown 20 Sep. 1889. Taken by Edward Sturtevant, Collection of Edward Sturtevant." My assistant wrote in the Catalogue, between quotation marks:—"This is the only one I ever saw in this locality (salt marshes between 2d and 3d Beaches)." I am unable to

trace this statement to its source but it must have originated with Mr. Sturtevant and it may have been taken from one of his letters, afterwards destroyed.

In Millais's admirable 'Natural History of the British Surface Feeding Ducks' I find a figure (No. 3, Plate XVII) of an "immature male" European Widgeon, "coming out of the eclipse plumage into winter dress, age 16 months." Males of this age and condition somewhat resemble the females, from which they may easily be distinguished, however, by the presence of conspicuous grayish mottling on the scapulars and by a large white patch on the wing. From fully adult males in corresponding dress they differ, according to Millais, only in having the white on the wing somewhat less pure and widespread. Judged by this test my Rhode Island specimen is evidently mature, for the white on its wings is immaculate and of nearly maximum extent. In respect to every other detail of color and marking the bird agrees almost perfectly with the representation of the European Widgeon to which I have just called attention. In his text relating to the American Widgeon (which has been taken a few times in Great Britain) Millais says (on page 57):—"The old male in eclipse plumage more closely resembles the female of his own species than our drake Wigeon—his flanks are very grey-brown, and not that rich, red-brown colour seen in our bird." The female, also, is described by him as differing from that of the European species in a similar way, having "not so much red-brown on the flanks and breast."

Although it is not always safe to rely largely on plates and descriptions, however accurate, when identifying obscurely characterized birds, the evidence just given is sufficient, in my opinion, to warrant a rather positive reference of the Widgeon taken by Mr. Sturtevant at Middletown, Rhode Island, to *Mareca penelope*, of which, indeed, it seems to be a nearly typical representative. It is, I believe, the first European Wigeon known to have been obtained in New England. The second (hitherto supposed to have been the first) was shot in Monponsett Pond near Halifax, Massachusetts, on October 20, 1899. When I referred to the latter in 'The Auk'¹ as a "fine old male in remarkably handsome plumage, I had not seen Millais's book which, indeed, was not published until the following year. On reëxamining this specimen in the light of his testimony, I find that I was not mistaken in regarding it as mature; for its wings closely resemble those of the Wigeon killed by Mr. Sturtevant although in most other respects it is very unlike his bird owing to the fact that it is in full winter plumage. It came into my possession not long after it was recorded in 'The Auk.' Soon after this I secured the remains of a third European Widgeon to which Dr. Townsend has alluded in the following words.² "There is in Mr. William Brewster's collection the head and one wing of an

¹ Auk, XVIII, No. 2, April 1901, p. 125.

² C. W. Townsend, Birds of Essex County, Massachusetts, Memoirs Nutt. Orn. Club, III, 1905, p. 129.

adult male of this species shot at Marblehead on December 29th, 1900." This statement is not quite correct for I have *both* wings of the Marblehead bird and they indicate plainly that it was not more than six or seven months old when killed, being essentially like those of a female Widgeon and wholly without the white patches which, according to Millais, are sometimes shown by the male soon after the close of his first winter and invariably assumed by him before the end of his second autumn; after which he never lacks them at any season,—even when masquerading, for a brief time in late summer, in the subdued garb so generally like that of his mate and so appropriately termed his "eclipse" plumage.—WILLIAM BREWSTER, Cambridge, Mass.

Snow Geese in Massachusetts.—The seaboard of eastern Massachusetts was once visited regularly by considerable numbers of Snow Geese, if we may credit the testimony of certain early Colonial writers. Thus Wood, referring to the region about Lynn and to a period extending from 1629 to 1633, says they came "in great flockes about Michelmas" and after remaining six weeks, filed "to the Southward, returning in March and staying sixe weeks more" before continuing their spring migration northward. Just when they discontinued this practise is not definitely known but it was probably abandoned long before the beginning of the Nineteenth Century. During the past fifty years or more they seem to have occurred only at infrequent intervals and, as a rule, singly, although Dr. Townsend reports¹ that as lately as November, 1903, Mr. W. H. Vivian "saw a flock of about fifty white birds resting on the beach at Ipswich" Massachusetts. "He thought at first they were gulls, but they got up and flew off honking and he saw that they were white geese."

In view of some of the facts just mentioned I was not less surprised than interested to learn that Mr. M. Abbott Frazar had seen a large flock of Snow Geese at Townsend, Massachusetts, on April 13, 1908. He has written me two letters concerning them, from which, with his kind permission, I now make the following extracts, changing or transposing a word or two here or there:—

"I heard the geese making a tremendous noise in the distance and soon caught sight of them about a mile away, coming towards me and flying in a compact bunch, not in V-shape. They were all calling and acting as if lost or badly scared. They passed directly over my head not seventy yards up. There were at least seventy-five and more likely one hundred in the flock, . . . and all were in full plumage. I looked them over carefully to make sure there were no Canadas in the lot and there was not a gray bird of any kind. I could not be in doubt about this for they had not passed my house over four hundred yards when they swung so that the light shone on them making them look like a snow bank in which a dark bird would

¹ C. W. Townsend, Birds of Essex County, Massachusetts, Mem. Nutt. Orn. Club, No. 111, p. 147.

have been conspicuous. They approached me from the southwest, flying about northeast, and then swung around by the west finally disappearing over the point where I first saw them, after making a circle perhaps a mile in circumference. There is a small river, hardly more than fifty yards in width at the widest, just beyond where I lost sight of them. The nearest pond I know of is three miles away."

Inasmuch as Mr. Frazer is an ornithologist and sportsman of long and varied experience one may accept, without the slightest hesitation, his confident assurance that the birds he observed, under conditions so favorable for field identification, were Snow Geese. It must remain doubtful, however, to which form of this species they belonged, although the probabilities indicate the smaller bird *hyperborea*, that being of commoner occurrence in New England than its larger subspecies, *nivalis*.—WILLIAM BREWSTER, *Cambridge, Mass.*

Another Ohio record for *Oidemia deglandi*.—Among a number of birds which I recently received from the Ohio State University in exchange for my collection of mammals there is a female of this species (*Oidemia deglandi*), shot March 10, 1881, at the Licking County Reservoir in Ohio. Prof. L. Jones, in his Catalogue, mentions the two specimens recorded by Dr. Wheaton and two specimens in the Oberlin Museum. Dawson and I recorded a fifth specimen shot in 1881 in Sandusky Bay. This present specimen then makes the sixth record for the State of Ohio. As Dawson had the collection of the Ohio State University at his elbow when writing his book, it is certainly peculiar that he should have overlooked this specimen and there may be perhaps other specimens in this collection not yet brought to light.—W. F. HENNINGER, *New Bremen, Ohio.*

The Masked Duck — A Correction.—In 'The Auk,' Vol. XXV, No. 4, page 472, will be found a note by me on the capture of a Masked Duck (*Nomonyx dominicus*) in Chatham Co., Ga., on Oct. 5, 1906. The capture was reported to me by Mr. G. R. Rossignol, Jr. (in whose possession it was) and Prof. W. J. Hoxie, another Savannah ornithologist and I had full faith in the judgment of these gentlemen. However, since writing said note I have visited Savannah and had the pleasure of examining the collections of each and was both surprised and disappointed to find that they were mistaken in this specimen. It is, without doubt, a Lesser Scaup, and they were misled by rust colored stains on its breast and belly.

While these have every appearance of being caused by grease, Prof. Hoxie is now of the opinion that it is from some compound of iron in the water frequented by the bird, as he states that he has since observed it in a less degree on other specimens. I deeply regret that the error was made and my note written.—ISAAC F. ARNOW, *St. Marys, Ga.*

The Little Blue Heron in New Jersey.—In glancing over the January issue of 'The Auk,' I noticed Mr. Reginald Heber Howe's note on the occurrence of the Little Blue Heron in New Jersey and the question he raised

as to whether this influx of birds was attributable to excessively hot weather. To this I would say emphatically, no. The Egret, it is true, is now a very rare species in either Pennsylvania or New Jersey but the Little Blue Heron invades both States periodically during late summer. Though personally I have seen but few birds, yet records have come to me with great regularity of their occurrence during the last four years at numerous localities in widely separated parts of New Jersey (barring the mountains), while in Pennsylvania they are even taken occasionally in the Alleghanies. At certain periods in late August they may even be called abundant. It would seem that each year after the breeding season they wander north, usually in flocks, and spend August and the first half of September on northern feeding grounds.—R. C. HARLOW, *State College, Pa.*

The Yellow Rail at Salem, New Jersey.—I have recently secured from a Mr. McKee of Philadelphia a mounted specimen of the Yellow Rail, with full data, which Mr. McKee took at Salem, New Jersey, on October 24, 1908. The bird is an adult female in fine plumage but very poorly prepared. This is the most recent capture of the Yellow Rail in the State and the fourth record for the State.—R. C. HARLOW, *State College, Pa.*

The Black Rail (*Creciscus jamaicensis*) in the District of Columbia.—Through the courtesy of Mr. H. M. Darling, of Washington, D. C., the Biological Survey has recently received a specimen of the little Black Rail (*Creciscus jamaicensis*), collected on the Eastern Branch of the Potomac, September 1, 1908. The specimen is adult, mounted, but with the sex unmarked. At least three earlier records of the occurrence of this species in the District of Columbia have been published. In September, 1861, the bird was reported as seen by Coues and Prentiss.¹ On June 6, 1879, a male (No. 78,384, U. S. National Museum) was collected by Shekells near Washington²; and on May 29, 1891, a specimen was taken by R. L. Jones and recorded by E. J. Brown.³ The specimen collected by Mr. Darling is apparently the third actually captured, and the fourth record for Washington.

The Black Rail has also been taken by John Dowell at Piscataway, Prince George County, Maryland, Sept. 25, 1877 (No. 97,717, U. S. National Museum),² and several specimens are said to have been taken on the Patuxent River in Maryland, not far from the northeastern boundary of the District.—T. S. PALMER, *Washington, D. C.*

Occurrence of the Whimbrel (*Numenius phaeopus*) off the coast of Nova Scotia.—In October, 1907, I secured an adult female specimen of this small European Curlew which has an interesting history. On May 23, 1906, it came aboard the steamship 'Bostonian' when she was westward

¹ *Avifauna Columbiana*, p. 101, 1883.

² *Auk*, Vol. XXIV, p. 209, 1907.

³ *Ornithologist and Oölogist*, Vol. XVI, p. 108, 1891.

bound and not far to the southward of Sable Island, Nova Scotia or,^r to quote the manuscript record literally, in "Lat. about 43° N., and Long. 60° W." "There had been a northeast gale for five days," which perhaps accounts for the occurrence of the bird so far to the westward. For two days previous to its capture it had been seen following the steamer. When it sought refuge on her decks it was utterly exhausted and very much emaciated, being, indeed, "nothing but skin and bones." "The men on board tried" to revive it "with food (probably corn beef and hard tack) . . . but it died a short time before the steamer reached port." Her Second Officer, S. A. Cornwell by name, took it in the flesh to D. B. Mackie of Malden, Massachusetts, by whom it was skinned, sexed and mounted and from whom I afterwards purchased it, through the kind offices of Dr. Lombard C. Jones, also of Malden. I am further indebted to the latter gentleman for the above data, all of which I have compiled from letters written by him to Mr. Walter Deane in 1907, and from one addressed to me personally, that has come within the past week.

It would perhaps be not wholly unreasonable to maintain that the record just given entitles the Whimbrel to a place in New England lists; for the bird to which it relates had apparently flown unaided to within six hundred miles of the sea coast of New Hampshire, in about the latitude of Portsmouth, and similar instances of "casual occurrences" have been accepted on no better evidence than this. In any case the specimen furnishes a definite and perfectly satisfactory North American record of a European species which, if I am not mistaken in my recollection, has been found previously on this side of the Atlantic only in Greenland, where it is said to have been taken a dozen times or more.— WILLIAM BREWSTER, *Cambridge, Mass.*

Wild Turkey (*Meleagris gallopavo*).—Mr. Rudolph Borchardt, the pioneer taxidermist of Denver, informs me that in the fall of 1868 he killed three Wild Turkeys, out of a flock of twenty-five or thirty, in the oak brush in what is known as the Oak Hills, about 6 miles above the mouth of Plum Creek, which empties into the Platte River, south of Denver. The remaining members of the flock were, one by one, killed by the Indians. These birds had frequented this locality for two or three years previous. He states also that these were the last and only Wild Turkeys that he ever heard of within a good many miles of Denver.—A. H. FELGER, *Denver, Colo.*

Capture of a Bald Eagle near Chicago, Ill.—On January 10, 1909, we shot an immature Bald Eagle (*Haliaeetus leucocephalus*) on the shore of Lake Michigan at Glencoe, Illinois. The bird was flying low over the ice that piles up along the beach.—THORNE C. TAYLOR, HUBBARD WOODS, and WALTER T. FISHER, *Chicago, Ill.*

The Prairie Falcon (*Falco mexicanus*) in **Western Minnesota**.—A specimen of this falcon was taken Sept. 11, 1894, in Traverse County, Minnesota,

by Dr. Wm. de la Barre of Minneapolis. The locality is in the extreme western part of Minnesota close to the Dakota line and lies within the Coteaux region of the State where the fauna and flora are strongly colored by species and subspecies characteristic of the plains region farther west. The specimen is now No. 3484 in the collection of the Minnesota Natural History Survey. It was recently examined by Dr. A. K. Fisher and the identification verified. As far as known this is the first well authenticated record of the occurrence of this species in Minnesota, the only previous record being by G. G. Cantwell (O. & O., Vol. XVI, Oct., 1891, p. 157) reporting the somewhat doubtful and unverified capture of a specimen in the winter of 1890-91 in Swift County, western Minnesota.—THOS. S. ROBERTS, *Minneapolis, Minn.*

***Agelaius phoeniceus fortis* in Louisiana.**—In a series of six Redwings taken at Belcher, Louisiana, February 4, 1908, was one specimen (♀) referable to this subspecies—the others being *A. p. phoeniceus*. This is the first record of the Giant Redwing in the State. The specimen in question was originally recorded¹ as *A. p. arctolegus* on the authority of H. C. Oberholser who, after going over the whole group again in greater detail, now decides that this bird should be referred to *fortis*.—ARTHUR H. HOWELL, *Washington, D. C.*

Pine Siskins and Winter Bobolinks.—The water front of Private Claims 120 and 321, City of Detroit, is a point of land reaching out into Lake St. Clair. The shore is lined with summer cottages behind which is a belt of weed-grown solid ground, about 100 yards in width, and then a marsh belt, about as wide, which brings you to the solid mainland. Between the marsh and mainland is a canal, the excavation from which forms an embankment some seven feet high with a row of Lombard poplars on the top. Near the westerly end the embankment runs out into the marsh and thence, at right angles, returns to the mainland leaving a strip of marsh, 20 × 100 yards, between the embankment and mainland that affords ample shelter from the lake winds and a food supply for the seed-eaters in the abundance of weeds growing along the sloping embankment. A number of times, during the last eighteen years, I have seen small flocks of Pine Siskins (*Spinus pinus*) migrating northward in this vicinity during March. It was not until the autumn of 1908 that I decided to secure a specimen and directed my attention to this point as the most promising locality. November 8 was the date set for the first visit and a better could not have been selected. Mr. Herbert H. Spicer and the writer spent two hours on the embankment opposite the piece of sheltered marsh and directly on the flight line of the Pine Siskins. They came from about 25 degrees east of north in flocks of from three to a hundred or more indi-

¹ Proc. Biol. Soc. Washington, XXI, p. 121, 1908. Of the identity of the specimen of *arctolegus* recorded from Natchitoches there is no question.

viduals, and at intervals of about ten minutes between each flock. When the lake was reached they rose higher and continued their journey without a pause, except one large flock that broke in confusion and swung back to the weeds on the mainland but joined the next flock a few minutes later. November 15 the flight had ceased and only one flock of 23 birds was seen. They were in the weeds back of the cottages and refused to be driven away. They were gone on the 22d, and from that date to the present writing, January 12, only one to four individuals have been noted on any one day, and none of these were migrating. When the Redpolls reach here from the north they are content to remain, and I fail to understand why the bulk of Siskins go further south, as local food conditions are in every way favorable.

While observing the flight of Siskins, November 8, we saw a bird perched on a willow bush in the sheltered marsh and secured it. The report of the gun caused another to take flight which was also secured. They were Bobolinks (*Dolichonyx oryzivorus*), and dissection disclosed the fact that both were females and very fat. We then carefully beat over this marsh, together with the larger open marsh, but could find no more. November 15 and 22 we again unsuccessfully explored this section, but secured a male December 6 within a few yards of where the other two were taken. This bird must have arrived after November 22, for it seems impossible that he could have been there and escape detection. He was much emaciated and healed gunshot wounds were discovered in breast and wing. We went over this ground again December 13 without success. December 20 we were returning from the point when the characteristic call note of a Bobolink directed our attention to the bird passing overhead and making for the point. It was followed and taken. It turned out to be a male and in fine condition, being very fat. A careful examination failed to reveal the slightest trace of a previous injury; nevertheless I believe that temporary impairment of flight by gunners during the period of migration explains the presence of all four birds. The most interesting fact in connection with the two latter birds was their ability to endure 18° below freezing, for the mercury dropped to that point prior to December 6. I supposed the Bobolink to be of somewhat delicate constitution with reference to low temperature, as normally it arrives late in spring and departs early in autumn, but the above birds not only withstood the cold but in a thinly feathered and poorly protected condition. Examining the specimens for other points of interest I find that black feathers show on the throat, neck, flanks, thighs and across breast on the December 6 bird but are confined to sides of breast, flanks and thighs on the December 20 specimen, which seems to be a bird of the year. The general color of the underparts is buffy white on the former and buffy olive on the latter, and all the black feathers are edged with these colors, and this may indicate the beginning of the spring transformation.—J. CLAIRE WOOD, *Detroit, Michigan.*

Evening Grosbeaks again in Massachusetts.— Mr. M. Abbott Frazar has kindly given me permission to report the fact that, on the morning of February 7, 1909, he met with a small flock of Evening Grosbeaks at Townsend, Massachusetts. He was returning from a walk when he started the birds from the ground where they had been feeding on the fallen fruit of a rock maple that stands within twenty feet of the front steps of his farm house. They flew across the road to a smaller maple in which they alighted and remained for several minutes, allowing him to approach them closely and to obtain a good view of them. There were about ten of them, all in the plumage of the female. Their next flight was to the top of a tall pine some two hundred yards further off. Here they stayed a somewhat shorter time, before taking wing again, to disappear in the far distance. Mr. Frazar had been away from Townsend for four days before the date above mentioned. He was told that during his absence the Grosbeaks had been seen repeatedly by a man who works on his place. They have not since returned to it as far as he can learn. He was constantly on the watch for them during the remainder of his stay at Townsend, which terminated on the morning of February 11, when he came back to Boston. Not long after this he received and forwarded to me two letters written by a man living in South Sudbury, Massachusetts, who claims that his "door yard" was visited on February 14th, and again on the 15th, 1909, by three Evening Grosbeaks, two of which were males.

If I remember rightly, Evening Grosbeaks are known to have occurred in eastern Massachusetts on but two occasions prior to these; in 1890 when they appeared in considerable numbers, at many different localities, in January, February, and March; and on March 23, 1904, when five were found together in Beverly and three of them killed, by Mr. C. E. Brown.¹—
WILLIAM BREWSTER, *Cambridge, Mass.*

The Cardinal at Ipswich, Mass.— Last week a friend of mine at Ipswich wrote me that for the past two or three weeks there had been a beautiful strange bird which had been coming into his door-yard for food. The one that he described was practically red all over with a very bright crest on his head. At my earliest opportunity I visited the farm to find that when the bird came at noon he was a beautiful Cardinal. He has been there about a month up to the present writing and comes regularly to the door-yard for seeds and bread crumbs which are put out for the birds each day. He keeps very close to the house practically the entire time, living in some very thick clumps of spruce trees not far away. He has gradually become very tame so that he will come to within a few feet of the people who are feeding him. On the coldest mornings when the thermometer has registered in the vicinity of zero his disposition has been of the most cheerful, seeming to mind the cold not in the least and jumping about very actively, even coming to the window and calling for the food if it has not been put out in time for him.

¹ Auk, Vol. XXI, July, 1904, p. 385.

There are a number of Myrtle Warblers, a few Song Sparrows and Chickadees nearby and which occasionally alight in the trees which he seems to consider as his especial property. This apparently troubles him not a little and he usually drives the intruders away after watching them for a minute or two.

I thought this item might be of interest, as the Cardinal is almost never recorded in New England, and in the course of twenty years of bird study in this vicinity I have never had the fortune to meet with one before.—FRANK A. BROWN, *Beverly, Mass.*

Dendroica discolor and Dendroica vigorsi in Eastern Massachusetts in Winter.—January 2, 1909, I shot a Prairie Warbler at South Yarmouth, Mass. The bird was on a dead pine that had fallen to the beach from the sand bluffs and was probably in company with several Myrtle Warblers that were in the vicinity. Unfortunately the bird was so badly mutilated that I did not save it. Mr. F. H. Kennard was with me at the time, and the next day in the same town saw at close range another bird of the same species. This bird was among a mixed flock of Pine and Myrtle Warblers, Red-breasted Nuthatches, Kinglets and Chickadees.

There were somewhere between 25 and 50 Pine Warblers in this flock, in both adult and first winter plumage.—F. B. McKECHNIE, *Ponkapog, Mass.*

The Carolina Wren at New Haven, Conn.—The Carolina Wren (*Thryothorus ludovicianus*) was reported as a rare resident at New Haven from about 1901 to 1904, but so far as I am able to ascertain none have been seen here since the severe winter of 1905–06 until December, 1908. On the 25th of December, Mr. A. W. Honywill, Jr., saw one of these birds in Edgewood Park. Four days later, on the 29th, I was attracted by the loud song of a Carolina Wren and succeeded in positively identifying two individuals. These birds were in the same locality as the one seen on the 25th. On January 2, 1909, I took a Carolina Wren only a few hundred yards from the above mentioned Park, thus absolutely proving the presence of the birds in this locality.—CLIFFORD H. PANGBURN, *New Haven, Conn.*

Breeding of the Louisiana Water-Thrush in Philadelphia.—The status of the Louisiana Water-Thrush (*Seiurus motacilla*) in Pennsylvania is, to say the least, peculiar. Common in the southwestern counties, it grows scarcer in the east, and though found regularly in the valley of the Susquehanna, and even in company with *S. noveboracensis* on the tops of the Alleghanies, the general opinion of our ornithologists seems to be that it is one of the rarest breeders in the southeastern area. For many years this idea has prevailed and it is with the hope of fixing the correct status of the Louisiana Water-Thrush that this article is written.

Beyond a doubt, the bird is rare within the counties of Delaware, Chester, Bucks and Montgomery, but in Philadelphia it would seem to claim a place as a regular summer resident—at least in the Wissahickon Valley.

During the period between 1885-1890 the late Harry K. Jamison did a vast amount of field work in this territory and in his note books (now in the author's possession) I find records of the finding of two nests and the observation of many birds. And even prior to this time at least two sets were taken there by a collector named Preble. In 1904, Mr. Chas H. Rodgers records in 'The Auk' his observations of a pair which evidently had young at this locality.

These seem to constitute the only breeding records of this species prior to the year 1908, when I decided to investigate the region in search of the birds. With this object in view I made several trips to the Wissahickon Valley in Fairmount Park and observed Water-Thrushes each time. On May 26, several were seen, and again on June 7, full-fledged young of at least two pairs were noted in company with the parents. At my suggestion my friend R. F. Miller searched through the region several times in late June and July and on every trip observed Water-Thrushes. On summing up the birds noted, we estimated that at least five pairs bred along the creek within a stretch of three miles.

In view of these data it would seem that though undoubtedly rare in the surrounding country, the Louisiana Water-Thrush may now claim, and probably always could claim, a place among the regular summer residents of the County of Philadelphia.—RICHARD C. HARLOW, *Pennsylvania State College*.

A Spring Record for Bicknell's Thrush on Long Island.—In looking over the series of Gray-cheeked Thrushes in the Brooklyn Institute Museum a few days ago I noticed one specimen that seemed very small. A careful examination showed it to be a typical example of Bicknell's Thrush. It is a male in nuptial plumage and was collected by the writer on the divide north of Jamaica May 22, 1900.—GEO. K. CHERRIE, *Brooklyn, N. Y.*

Albino Robins.—A record of an individual albino of any variety of bird would be of value only as illustrating the fact that albinism, partial or complete, may occur in any avian species: it would, however, be of considerable interest, and of some importance could one follow the varied fortunes and vicissitudes of any given albino bird.

This is denied us through the relative uncommonness of pure albino forms, an uncommonness which seemingly substantiates the idea that all such forms must perish early, probably long before any opportunity to breed and transmit the peculiarity is possible. Consequently any observations on a succession of albinos emanating from the same locality are worthy of record. Hence this record of experiences had during the summer of 1908, concerning albino robins, and of observations communicated to the writer by obliging friends.

Through the courtesy of Mr. A. H. Felger of Denver, the writer is enabled to state that three pure albino robins were seen in City Park, Denver,

during the summer of 1905, all apparently from one nest, and two more in the summer of 1906 in the same place, all being birds of the year. This park is within three blocks of the writer's home; it is well covered by a large variety of trees, has a considerable water supply, and forms an ideal home for many of our summer resident birds.

There is no record that any of these albinos returned to the park during any succeeding year.

A son of one of my neighbors saw a young pure albino robin in the immediate vicinity of my home during the summer of 1907.

On June 3, 1908, the writer received a live young robin, a pure albino, which was one of a brood of four robins (all the others being apparently normal) raised in a neighbor's yard about two hundred feet from the writer's house. A second young pure albino robin was given to the writer six days later (June 9), it having been raised in a nest half a block to the rear of the first albino's nest, and on June 11 (eight days after the receipt of the first), a third young pure albino robin was presented to the writer. This last one was found about the premises of Mrs. Ernest Knaebel, distant about half a mile from the location wherein were found the first two. These birds were all very tame and allowed themselves to be caught without fear or resistance. Everyone was a typical albino, with every feather pure white, and with pink feet, legs, and eyes, and white bill.

If any one of these birds were put in such a position that its head was between a strong light (the sun, or a bright lamp) and the observer, the effect was startling, the eye viewed by the observer shining like a glowing coal. This transillumination through both eyes illustrated strikingly the absence of all pigment in the iris and retina, and showed, too, how nearly opposite are a bird's eyes, and demonstrated that in a young bird the interocular septum (the perpendicular plate of the ethmoid) is cartilaginous, and remarkably translucent.

All of these birds were lively, and soon learned to take worms from the hand. They were all given to Mr. Felger who tried to raise them with the help of a friend experienced in successfully raising other young robins. These three albinos, notwithstanding that they all ate well, died within two or three weeks of capture, of an obscure intestinal disorder. The writer is inclined to believe, through the testimony of friends qualified to speak on the matter, that it is not very difficult to bring up nestling robins by hand, and feels that the failure, in experienced hands, to rear these albinos lends color to the belief that albinos are inherently of weak constitution.

It will be seen from the above that we have to deal with an unbroken series of albino robins observed during four succeeding seasons all in an area not to exceed one mile in diameter.

It seems reasonable to assume that these birds all emanated from a pair, or their descendants, originally and perhaps continually nesting in City Park. The inheritability of albinistic traits is undeniable and it is conceivable that this trait may be cropping out in the succeeding generations

of robins derived from this hypothetical pair in City Park, though most of the later generations may show no albinism at all. Considerable probability is lent to this hypothesis by the fact that the mother of the bird of June 3, 1908, was decidedly *white* on the belly and breast. It came a number of times to feed the albino young one while the young bird was on the writer's premises, and gave ample opportunity to note this variation from the normal. The writer also noted later on during the summer just passed in the same neighborhood two young robins which were nearly gray all over, both showing very little blackish even on the head or back; one of these two birds had the right outer tail feather pure white, and the left one half white. The coming summer will be of more than usual interest in anticipation of seeing about the writer's neighborhood these partial albino birds, or other young pure albinos.

The almost complete absence of pure white species of birds inhabiting dark areas like forests, and the commonness of white forms in bright areas like the sea, or seashore, may be accounted for by detrimental environmental conspicuousness, or by beneficial inconspicuousness, respectively; one might infer from the failure of these six albinos of 1905, 1906, and 1907 to return to the region of origin, that they perished through being conspicuous marks for predaceous birds.

These observations on the three young of 1908 shed no light on the assumption held by some writers that albinos are more apt to be females, because the sex of but one of the three could with certainty be determined; it was a male.—W. H. BERGTOLD, M. D., *Denver, Colo.*

Unusual Dates for some Birds at New Haven, Conn.—White-throated Sparrows have been present in large numbers in Edgewood Park up to date (Jan. 2, 1909). Five Rusty Blackbirds have been in the same Park since December 26. I saw a Fox Sparrow on Dec. 22 and two of them on Jan. 2. On Dec. 22, near Lighthouse Point I saw two Red-winged Blackbirds and about twenty-five White-winged Crossbills. The date cannot be called unusual for the Crossbills, but they are rare here. On Dec. 26 and 28, I saw a male Towhee in Edgewood Park. On Dec. 21, at Mitchell's Hill, I saw a Yellow-bellied Sapsucker, and on Dec. 25, at Saltonstall Ridge, I saw four Red-breasted Nuthatches. Robins and Bluebirds have been seen occasionally, and on Dec. 25 Mr. A. W. Honeywill, Jr., saw a Hermit Thrush at Mitchell's Hill. On the next day Mr. Honeywill and I saw the thrush at the same place. These birds were all positively identified although none of them were taken.—CLIFFORD H. PANGBURN, *New Haven, Conn.*

Unusual Records for Massachusetts.—*Chaetura pelagica*. CHIMNEY SWIFT. I saw three in Sharon, Mass., on Oct. 12, 1907, which is apparently the latest date for the State. One of them flew almost directly overhead, affording perfectly satisfactory identification.

Sayornis phœbe. PHŒBE. Saw one in Stoughton on Oct. 31, 1908.
Lanivireo solitarius solitarius. SOLITARY VIREO. Saw a singing bird at fairly close range on April 11, 1908, in Stoughton. Saw another singing bird in Sharon on October 12, 1907.

Compsothlypis americana usneæ. NORTHERN PARULA WARBLER. Saw one in Stoughton on April 25, 1908, the throat of which lacked the cross-band.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER. Saw a male at very close range on April 28, 1908, in Stoughton.

Dendroica blackburniæ. BLACKBURNIAN WARBLER. Saw an elegant male in Sharon on May 31, 1907.—SIDNEY F. BLAKE, *Stoughton, Mass.*

Massachusetts Bird Notes.—Florida cœrulea. An immature male in the white plumage was shot in Stoughton, Mass., by a Mr. Berry, Aug. 22, 1908. The bird was mounted by E. R. Adams of Canton, to whom I am indebted for the record, and is now in the collection of F. H. Kennard.

Centurus carolinus. In a collection of birds purchased some time since I found one of this species labelled "♀, Hull, Mass., 1882, W. B. R." (Richardson). The bird is not however a female but evidently a young male.

Empidonax trailli alnorum. Early in the morning of June 8, 1904, I found an Alder Flycatcher singing in a clearing by the roadside within a mile of my home in Ponkapog. Frequent visits convinced me that the bird was breeding, but it was not until the 24th that I found and took the nest with 4 eggs.

The clearing was originally a swampy tract of pine, white cedars and red maple but was chopped over in the winter of 1901-02, resulting in a sprout growth of maples combined with such shrubs as *Comus paniculata*, *Alnus incana*, *Rhus venenata*, *Azalea viscosum*, etc.; the ground being still damp enough to support a growth of sphagnum and skunk cabbage.

The nest was well within the bushy area, 2½ feet up in an *Azalea viscosum* bush, of characteristic composition—dead grass with long loose ends hanging down.

Several times since I have seen Alder Flycatchers in both Canton and Norwood during the breeding season but have not taken the necessary time to find more nests.

Sitta canadensis. From 1900 to 1904 I spent considerable time in a part of Canton that seemed very favorable for birds of the Canadian Fauna. Here was a 50-acre tract of large white pines with adjoining swamp of white cedar and red maple, and considerable large deciduous growth. Numerous plants and shrubs of a northern character grew throughout the area, and I found breeding there such birds as the Barred Owl, Broad-winged Hawk, Hairy Woodpecker, Solitary Vireo, Canadian Warbler, and Brown Creeper.

April 29, 1900, I first saw the Red-breasted Nuthatch here and it seems quite probable that they were breeding; however on May 18, 1902, Mr.

Owen Durfee and I located a pair of the birds on the edge of the pines in a mixed growth of oak and chestnut, about 50 yards from the maple swamp. The female soon went to the nest near the top of a small dead black oak stub 12 feet high. After spending some time watching and photographing the birds I collected the stump with a set of six fresh eggs. At the entrance hole was the characteristic daub of pitch.—F. B. McKECHNIE, *Ponkapog, Mass.*

Three New Records for the State of Washington and One for Oregon.—

The past winter has been by far the most severe of any during my residence of twelve years in the State of Washington, as it has also been throughout the other parts of the Northwest. Consequently a large number of rare visitors—mostly northern birds—appeared in very considerable numbers. I was fortunate enough to obtain the three following species, which form, to the best of my knowledge, new records for the State. They have been very kindly identified for me by Dr. A. K. Fisher and Mr. H. C. Oberholser.

***Junco hyemalis hyemalis*.** SLATE-COLORED JUNCO. An adult male collected in my back garden here in Tacoma on February 4, 1909. It was first seen on January 15, and appeared at intervals until the date when I was finally able to secure it. It was always in company with a large flock of Shufeldt's Juncos (*Junco oreganus shufeldti*), amongst which its duller colors rendered it most conspicuous.

***Passerella iliaca insularis*.** KADIAK FOX SPARROW. An adult female collected in my back garden here in Tacoma on January 13, 1909. What was presumably the same bird was seen during the week previous by other members of my family. The fact that it was exceedingly fat makes this seem all the more probable, as I fed a large flock of birds daily throughout the entire winter.

***Passerella iliaca meruloides*.** An adult female was collected at the town of Kirkland, King County, Washington, on January 11, 1909, by Miss Jennie V. Getty of that place. It was found frozen to death, and was greatly emaciated owing to starvation. Miss Getty very kindly presented it to the writer, and also reported seeing a considerable number of similar birds, as well as several much larger ones with the same characteristics. Miss Getty is a careful and experienced observer, and her notes are entitled to the fullest consideration.

I now take pleasure in giving the following record from southwestern Oregon; identification through the kindness of Dr. A. K. Fisher and Mr. H. C. Oberholser.

***Melospiza melodia rufina*.** SOOTY SONG SPARROW. This bird was taken by my brother, Mr. C. W. Bowles, on September 16, 1907, at Takilma, Josephine County, Oregon. Unfortunately the sexual organs were obliterated but otherwise it is an excellent skin. Unless I am mistaken, this is the most southern point from which this subspecies has yet been recorded.—J. H. BOWLES, *Tacoma, Wash.*

Labrador Notes.—In a box of bird-skins kindly sent me by Dr. W. T. Grenfell from Labrador in November, 1907, the following are worthy of note:

Anas platyrhynchos. MALLARD. A female or young bird taken at Nachvack in October, 1904. This duck breeds west of Hudson Bay, and is a rare transient visitor in northern Labrador.

Dafila acuta. PINTAIL. Adult male, Nachvack, June 1, 1905. This duck is a rare transient visitor in Labrador. Mr. G. M. Allen and I obtained a skin at Hopedale and saw another skin, but were able to find only five other records for Labrador. (Birds of Labrador, Proc. Boston Soc. of Nat. Hist., 1907, p. 328.)

Somateria spectabilis. KING EIDER. A curious specimen in partially albinistic plumage, shot at Battle Harbor, June 19, 1907. The whole bird is creamy white or buff, with irregular brownish patches. The belly is uniformly darker, almost vinaceous in color. The head and neck are finely lined with grayish brown streaks. The rectrices are nearly pure white, as are also the primaries and secondaries. All the feathers, especially those of the wings and tail, are much worn.

Porzana carolina. SORA. An adult taken near Harrington on the southern coast about July, 1907. This is the second record of its occurrence in Labrador. The first was of a specimen taken at Sandwich Bay in 1898. (Birds of Labrador, *loc. cit.*, p. 345.)

Falco islandus. WHITE GYRFALCON.—A very white specimen of this species taken at Nachvack, on October 13, 1905. In this connection it is interesting to note that Mr. Allen and I, who recorded this bird at Henley Harbor on the southern coast on August 2, 1906, (*loc. cit.*, p. 368) have since been told by Dr. Grenfell that a pair of these birds have bred there regularly, and that he remembers seeing them there in 1896.

Colaptes auratus luteus. NORTHERN FLICKER. A male from Sandwich Bay, just south of Hamilton Inlet, August, 1908. Mr. Allen and I concluded that this species was an "uncommon summer resident in southern half of Labrador, occasional as far as Hudson Strait" (*loc. cit.*, p. 377). The specimen is an interesting one as it appears to be somewhat darker than specimens from the New England States.

Dendroica aestiva. YELLOW WARBLER.—From Northwest River, Hamilton Inlet, taken by a cat, September 1, 1905. I hope that Mr. Oberholser will soon report on this interesting specimen.

I would also mention the following specimen kindly sent me in the autumn of 1908, by Mr. John Goleby, a Moravian brother stationed at Hopedale:

Hirundo erythrogaster. BARN SWALLOW, taken at Hopedale in July, 1908. The only previous record for Labrador is that the bird "breeds at North-west River at the head of Hamilton Inlet" (*loc. cit.*, p. 403).—CHARLES W. TOWNSEND. M. D., Boston, Mass.

RECENT LITERATURE.

Grinnell's 'The Biota of the San Bernardino Mountains.'¹ — During the seasons of 1905, 1906, and 1907, the author devoted considerable time, often aided by several assistants, in investigating the fauna and flora of the San Bernardino Mountains in southern California, which, from their altitude and isolation, offer an attractive field for the study of distribution. The present report of his researches includes a consideration of the life zones of the region; descriptions of the localities visited, with special reference to the faunal complexion of each; a discussion of the bird population and the influences modifying it; a list of the important species of plants, with notes on their distribution; a list of the birds of the region (139 species), with a detailed record of the distribution of each, with biographical and critical notes on many of them; and similar lists of the mammals and reptiles.

The San Bernardino region rises from a base level, on the south side, of from 1500 to 2500 feet, and on the north side of about 4000 feet, to the maxima of 10,600 (San Bernardino Peak) and 11,485 feet (San Gorgonio Peak), and thus includes the life zones from the Lower Sonoran to the Alpine-Arctic. The limits of these several zones are discussed, with lists of the plants that characterize them.

Under the caption 'Bird Population and its Modifying Influences,' the food supply is considered to be the factor that determines the maximum number of birds that can exist in a given region. "Competitive struggle between species has led to the adoption of remote and otherwise unexplainable habitats, temporary or constant. It has also led to the development of various and perfected means of food-getting." In this connection attention is called to the "almost universal exodus in July," from the coastal lowlands of southern California, "of many of the birds of the 'summer-visitant' category which have bred and raised broods during April, May and June." A considerable number of species (which he enumerates) "become scarce, or disappear altogether towards the end of July . . . when everything becomes excessively dry: among plants most annuals have died, and the perennials have ceased active growth; insects become relatively rare, except along watercourses. The May bird population, which is abundant, cannot continue to be supported after this 'winter' [dry] season sets in, and the result is, they must move elsewhere." He has found that they then move up to the mountains, in families of young and old, where the climate is moister, where vegetation still flourishes, and where insects are abundant.

"All this invasion of the higher altitudes occurs when spring and summer

¹ The Biota of the San Bernardino Mountains. By Joseph Grinnell. University of California Publications in Zoology, Vol. V, No. 1, pp. 1-170, pl. i-xxiv. December 31, 1908.

are just dawning there, but when the foothills and plains below are becoming dry and barren under the July heat, no longer productive of the food-supply which they were in a condition to offer earlier in the season. I believe these relative conditions prevail throughout southern California. Without the mountains to accommodate the excess of bird population, which could not be supported in late summer on the withered lowlands, we would have fewer birds in the spring. The 'resident' species return to the lowlands when the cold begins to reduce the food supply in the mountains; and, what is also noteworthy, so do the 'summer visitors,' which thus become transients for a few days in the fall as they pass back through the lowlands on their way south, or rather southeastward. These latter, therefore, undertake three distinct migratory journeys during the year: from their winter habitat northwestward to their spring breeding-place, from the latter up, and often northwards, to their summer feeding-grounds, and then back down and then southeastward to their winter habitat."

These well-attested facts have an interesting and important bearing upon the general subject of bird migration, and especially upon the origin of migration. As said later by Grinnell: "The geometric ratio of reproduction makes the population of a species an elastic quantity, expanding into any favorable food area presenting itself. And the masses of different species press against one another, like soap-bubbles, crowding and jostling as one species acquires, through modification of food-getting powers and perfected adaptability to other conditions, some advantage over another." In this connection is discussed the mortality of birds and its causes, from the standpoint of the author's observations in southern California.

The report on the birds (pp. 50-54), like those on the mammals and reptiles, consist of extensively annotated lists, relating to the habits and local distribution of the species. The illustrations include a colored map (plate i) of the life zones of the region, and a transverse profile, also in color (plate ii), indicates both their vertical and horizontal extent. Most of the remaining twenty-two plates are from photographs, and represent types of vegetation and landscapes.—J. A. A.

Grinnell on Birds of Southeastern Alaska.—"In the spring of 1907 a party was organized and outfitted by Miss Annie M. Alexander, for the purpose of exploiting the fauna of certain islands. The party consisted of Mr. and Mrs. Frank Stephens, Mr. Joseph Dixon, Mr. Charles Littlejohn, and Miss Alexander herself, who headed the expedition." The report on the work accomplished¹ consists of nearly one hundred pages, illustrated with two plates and a few text figures. The introduction and the report on the birds are by Dr. Joseph Grinnell; the 'descriptions of localities' are by Frank Stephens and Joseph Dixon; the report on the

¹ Birds and Mammals of the 1907 Alexander Expedition to Southeastern Alaska. University of California Publications in Zoology, Vol. V, No. 2, pp. 171-264, pll. xxv, xxvi, and text figs. 1-4. February 18, 1909.

mammals is by Edmund Heller. From April 17 till August 9 the entire party was occupied in collecting and exploring at various points on Admiralty, Baranof, and Chichagof Islands, and at Glacier Bay, at which latter date most of the members returned home. Mr. Stephens, however, remained and continued to work in the same region till August 29, and later stopped at Thomas and Helen Bays, between Juneau and Dixon Entrance. The collections included 532 birds, 22 sets of eggs and nests, and 476 mammals, and has been presented by Miss Alexander to the University of California Museum of Vertebrate Zoölogy. A map shows the region traversed, and there are several half-tone scenic illustrations.

The report on the birds, by Dr. Grinnell, records 99 species, of which 81 were represented by specimens, with very full notes based on the field books of the collectors. Two species and four subspecies are described as new, namely: *Lagopus alexandra*, from Baranof Island; *Lagopus dixonii*, from Chichagof Island; *Buteo borealis alascentis*, from Glacier Bay and Chichagof Island; *Picoides americanus fumipectus*, based on a single specimen from Chichagof Island; *Loxia curvirostris sitkensis*, from Admiralty Island; *Planesticus migratorius caurinus*, also from Admiralty Island. The author "still believes that there are two races of the Varied Thrush," in opposition to the recently expressed opinion of Mr. Ridgway. In this belief he is supported by the A. O. U. Committee, which at its last meeting declined to accept its proposed elimination, this decision being based on then recently acquired material (cf. Auk, XXV, July, 1908, p. 398).

The field notes here incorporated contain much interesting information respecting the breeding habits of a number of the species met with, and Dr. Grinnell adds important comment on variations of plumage, based in some instances on large series of specimens (38 skins of the rare Kitilitz Murrelet were obtained). The report is thus an important contribution to Alaskan ornithology.—J. A. A.

Grinnell on Birds observed at Salton Sea.¹—This paper gives observations on about half-a-dozen of the water birds seen, but a future paper on the land birds is promised. The expedition was made in April, 1908, in the interest of the Museum of Vertebrate Zoölogy, at the University of California, of which Dr. Grinnell is curator. On Echo Island, in Salton Sea, was found a large breeding colony of the American White Pelican (*Pelecanus erythrorhynchos*), "the southernmost nesting-colony" of this species. A census of the colony gave a total of "980 occupied nests, besides others in process of construction. At the very minimum there were 2000 pelicans here assembled." A very full account is given of the character of the nests, with photographic illustrations. On the nearby Pelican Island was a breeding colony of Farallone Cormorants, of which 147 nests were

¹ Birds of a Voyage on Salton Sea. By J. Grinnell, Condor, Vol. X, No. 5, Sept.-Oct., 1908, pp. 185-191.

counted that contained eggs, besides many others partly built. This island was formerly — two or three years before — the favorite nesting resort of the pelicans, but at this time only three nests of this species were seen there, the colony having moved to Echo Island.— J. A. A.

Chapman on the Life-Histories of the Booby and Man-o'-War Bird.¹

The observations here recorded were made during April, 1907, at Cay Verde, in the Bahamas, while on a collecting trip to obtain specimens, accessories, photographs, and other data for a 'Habitat Group' of these birds in the American Museum of Natural History. Although only three days and nights were spent at the key, the visit was successful, and forms the basis of the present report on the bird life of Cay Verde. No land birds appear to be resident on the key, but it is visited by a number of migrants, of which nine species were noted, in addition to the same number of water birds. The presence of these birds, says Mr. Chapman, "indicates that Cay Verde would be an admirable station for the study of the migration of birds throughout this region. The small size of the Cay [half a mile long and a fourth of a mile wide] would permit the taking of fairly accurate daily censuses, while the distance from the nearest land makes it the only available stopping-place in a large area. It is to this isolation that the presence of large numbers of breeding birds on the cay may be attributed." The birds accustomed to nest there are three species of tern, the Tropic-Bird, and the two species that form the subject of the present paper. The number of Boobies (*Sula leucogastra*) breeding on the cay was estimated to be about 1500 pairs, with between 200 and 300 pairs of Man-o'-War Birds. At this time most of the nests contained young, ranging in age from newly hatched to half grown, while some nests still contained eggs and some of the young birds were already on the wing.

A detailed account of the habits, nest, eggs and young is given for each species, and also of the development of the plumage in the young birds. Incidentally some errors made by Audubon in his account of these species are noted. It is shown beyond reasonable doubt that the Booby found by Audubon nesting on his "Noddy Island" (Bird Key, Tortugas Islands) and supposed by him to be "*Sula fusca*" (*S. leucogastra*) was really *S. piscator*. The correction of this error gives *Sula piscator* for the first time the status of a former breeding bird in the United States, where it is now only of accidental occurrence. On the other hand, Audubon's record of the breeding of the Man-o'-War Bird in the Florida Keys is discredited. The six plates, based on photographs, illustrate the nesting habits, manner of flight, and development of the plumage in both species.— J. A. A.

¹ A Contribution to the Life-Histories of the Booby (*Sula leucogastra*) and Man-o'-War Bird (*Fregata aquila*). By Frank M. Chapman. Papers from the Tortugas Laboratory of the Carnegie Institution of Washington, Vol. II, 1908 (1909), pp. 139-151, pll. i-vi. [Separates not dated, but distributed late in February, 1909.]

Warren on Birds of Montrose County, Colorado.¹—This is an annotated list of about 115 species, based on observations made by Mr. Warren during the month of April, 1906 and 1908, and notes furnished him by Mr. C. H. Smith, made during the last ten years. Montrose County is in the southwestern part of the State, on the Utah border, and is not well-known ornithologically.—J. A. A.

Sclater on the Winter Birds of Colorado.²—This is a pleasantly written account of winter bird life in the vicinity of Colorado Springs, prepared with a view to its interest for European readers, the author disclaiming that "there is anything original" in it, in the sense, we suppose, of new information. The commoner winter birds of the region are briefly mentioned, this running commentary being followed by nominal lists of the resident birds and winter visitants of El Paso County, Colorado.—J. A. A.

Wetmore's Notes on Some Northern Arizona Birds.³—This is a list of 40 species, based on specimens taken by the author at Williams, Arizona, February 24 to April 1, 1907, with extended and interesting field notes. Among the species recorded are six forms of *Junco*.—J. A. A.

Oberholser's List of Alabama Birds.—The 'First Biennial Report of the Department of Game and Fish of the State of Alabama,' covering the period from February 23, 1907, to September, 1908, contains (pp. 104–110) 'A List of the principal Birds to be found in Alabama,' by Harry C. Oberholser. This is purely a nominal list of 275 species and subspecies, which serves at least to show the author's personal views on various questions of nomenclature in cases where his preference for certain generic and a few specific names differs from that of the A. O. U. Check-List, about thirty instances.—J. A. A.

Oberholser's Revision of the Kingfishers of the Genus *Ramphalcyon*⁴—This revision is based primarily upon specimens collected by Dr. W. L. Abbott, in the East Indies. The range of the genus includes southern Asia, the Philippine Islands, Java, Borneo, Flores, Sumatra, and Sulu Islands. *Pelargopsis* Gloger, formerly employed for the group, is shown to be a *nomen nudum*, and is replaced by *Ramphalcyon* Reichenbach. Two species are recognized,—*R. melanorhynchus*, with three subspecies, and *R. capensis*, with 15 subspecies, of which four are here described as new. Heretofore each of the forms previously recognized has been given, with a single exception, full specific rank.—J. A. A.

¹ Notes on the Birds of southwestern Montrose County, Colorado. By Edward R. Warren. Condor, Vol. XI, No. 1, 1909, pp. 11–17.

² The Winter Birds of Colorado. By W. L. Slater, Ibis, July, 1908, pp. 443–450.

³ Notes on some northern Arizona Birds. By Alex Wetmore. Kansas University Science Bulletin, Vol. IV, No. 19, September, 1908, pp. 377–388.

⁴ Revision of the Kingfisher Genus *Ramphalcyon* (*Pelargopsis*). By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. XXXV, pp. 657–680. Published Feb. 9, 1909.

Van Oort's Avifauna of the Netherlands.¹—The number of species here recorded for the Netherlands is 335. The specimens taken in the Netherlands contained in the Leyden Museum of Natural History are recorded, the later acquisitions in detail, with notes in many cases on peculiarities of plumage, but rarely is anything said about the status of the species as a bird of the Netherlands, either in reference to the manner or seasons of occurrence, except in the case of the rarer species. There are, however, many important critical notes on the particular subspecies found in the Netherlands.—J. A. A.

Hartert's 'Die Vögel der Paläarktischen Fauna,' Heft V.²—Part V of this great work bears date February, 1909, after an interval of nearly two years since the publication of Part IV, in March, 1907. This part begins with the remaining species of *Phylloscopus* and ends at the beginning of the genus *Turdus*, which he announces will be taken in a broad sense, to include a large number of more or less current genera. The present part thus comprises the families Sylviidae and Crateropodidae of authors, and the species and subspecies numbered 796 to 986, practically all 'Palearctic.'—J. A. A.

Count von Berlepsch on the Birds of Cayenne.³—This enumeration of the birds of Cayenne is based primarily on a collection made by George K. Cherrie, assisted by Benjamin T. Gault, during four months (October, 1902–January, 1903), for the Tring Museum. This collection comprised 1300 well-prepared bird-skins, representing 254 species. In order to make the list complete, the author has added in brackets all the species that have been reported as occurring in Cayenne, this being, according to the author, the first attempt to give complete enumeration of the birds of that country. The list comprises 626 species, of which 553 have been satisfactorily determined as birds of Cayenne; the other 73 are hypothetically included, on the basis of doubtful records (23) or their general range (50). The author believes that we may add about 140 more as birds likely to occur there, so that "we are justified in computing the number of species inhabiting that country to be about 766." In footnotes, under each family, are enumerated the additional species that may perhaps occur in Cayenne.

The paper thus consists: (1) of a list of the species collected by Mr.

¹ Contribution to our Knowledge of the Avifauna of the Netherlands, being a List of all the Species of Birds hitherto observed, with special reference to specimens in the Leyden Museum. By Dr. E. D. van Oort. Notes from the Leyden Museum 1908, pp. 129–214, pll. vii, viii.

² Die Vögel der paläarktischen Fauna. Systematische Übersicht der in Europe, Nord-Asien und der Mittelmeerregion vorkommenden Vögel. Von Dr. Ernst Hartert. Heft V.—8vo, pp. 513–640, fig. 93–124. R. Friedländer und Sohn, Berlin. Published February, 1909. Price, 4 mark.

For notices of previous Parts see Auk, XXI, pp. 95, 505; XXII, p. 428; XXIV, p. 362.

³ On the Birds of Cayenne. By Hans Graf von Berlepsch. Novitates Zoologicae Vol. XV, pp. 103–164, 261–324. June and November, 1908.

Cherrie, and an enumeration of the specimens of each obtained, together with the dates, localities and measurements, and the collector's notes on the color of iris, bill, feet, and soft parts, etc.; (2) comment on the general character of the specimens, when necessary; (3) previous records of the species from Cayenne; (4) reference to the place of original description of the species, the citation of synonyms, if any, and a statement of the type locality, which is here sometimes for the first time assigned; (5) occasional comment (in footnotes) on questions of nomenclature. Only three forms (subspecies) are described as new, which may be taken to indicate that the ornithology of Cayenne is now pretty well known.—J. A. A.

'*Cassinia*.'—This always interesting annual¹ contains the usual variety of matter relating to the birds of eastern Pennsylvania, New Jersey and Delaware. Besides the abstract of the Proceeding of the Delaware Valley Ornithological Club, the membership lists of the Club, and a bibliography of contributions to the ornithology of the region, it contains the usual number of short papers, and Mr. Stone's report on the Spring Migration in the vicinity of Philadelphia, based on the combined observations of the members of the Club.

The first paper is a biographical sketch of George Ord, with a portrait, by Samuel N. Rhoads, in which is summarized the little that is at present known of the life and literary work of this pioneer American zoölogist. Ord was born March 4, 1781, but whether in Philadelphia or in England Mr. Rhoads is unable to state, and died in Philadelphia in 1866. He is principally known as the biographer and literary executor of Alexander Wilson, he having edited Wilson's eighth volume, and written the text of the ninth, both volumes having been published after Wilson's death. He also contributed the zoölogical matter to the second American edition of Guthrie's Geography, a work now so rare that only two or three copies are known to exist. This contribution, on account of its rarity and importance, was republished by Mr. Rhoads in 1894. Ord also published two editions of 'Wilson's American Ornithology,' respectively in 1824 and 1828-29, to which he contributed original matter. He also published biographies of Thomas Say and C. A. Lesuer. According to Mr. Rhoads, Ord was a lexicographer as well as a naturalist; his extensive contributions to Noah Webster's Dictionary were unacknowledged; Latham, of London, later "secured from Ord the whole MSS. of nearly forty years' work in philology, and in every instance, where he used it in compiling his new edition of Johnson's Dictionary he makes acknowledgment to the Ord MSS." Ord was an office-bearer for many years in both the American Philosophical Society and Academy of Natural Sciences of Philadelphia, of which latter he was President, 1851-1858, and, at different times, Secretary, Treasurer, and Vice-President of the Philosophical Society.

¹ *Cassinia*. A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia. 1908. Issued March, 1909. 8vo, pp. 84, and 3 half-tone plates. Price, 50 cents.

The other papers in 'Cassinia' are: 'The Mourning Warbler in Warren County, Pa.,' by Thomas H. Jackson; 'Some Birds of a Maurice River Farm,' by Chreswell J. Hunt; 'Catoxen Cabin on the Rancocas,' by George Spencer Morris; 'Bird-Life at Catoxen,' by Witmer Stone; 'Three Finds in South Jersey,' by Robert Thomas Moore; 'A List of the Birds observed on the Barnegat Region of the New Jersey Coast in August, 1908,' by Wm. C. Braislin, M. D.

The Club held sixteen meetings during the year 1908, with an average attendance of twenty-two. The officers for 1909 are William A. Shryock, President; Stewardson Brown, Vice-President; Chreswell J. Hunt, Secretary; Samuel Wright, Treasurer; Witmer Stone, Editor of 'Cassinia.' — J. A. A.

Stone's 'A Review of the Genus *Piaya* Lesson.'—Mr. Stone¹ here recognizes three species — *P. melanogastra*, *P. rutilus*, and *P. cayana*, the latter with 10 subspecies, two of which are described as new. This revision is based on 259 specimens, and, of course, is made from the modern viewpoint. He refers to a brief review of the group made by the present writer in 1893, pointing out several errors made, as he kindly says, "largely through lack of material," and notes that "he ignored Cabanis's explanation of the true nature of Gambel's *macroura*," etc. We may here explain that Part IV of the 'Museum Heirnanum,' which contains Cabanis's review of the genus, was not then accessible to us, the copy of the work then available containing only the first three parts; otherwise probably Cabanis's ruling on the type localities of *P. macroura* Gambel and *P. circe* Bonap. would not have been 'ignored,' and the consequent errors would have been avoided. It is of interest that Mr. Stone is able to so emphatically confirm Cabanis's opinions on these two important points.

After reviewing the history of the group, Mr. Stone presents a 'key to the species and subspecies,' followed by the synonymy and a brief description of each form. If the forms to which critical reference is made had all been given in the synonymy of the species it would have added to the convenience of future investigators of the group, and have made clearer the several nomenclatural departures from current usage, all of which seem to be well founded. It may be added that the two new subspecies — *P. cayana cauca* and *P. c. boliviana* — are based on recently acquired material in the American Museum of Natural History. — J. A. A.

Watson's 'The Behavior of Noddy and Sooty Terns.'²—This is the report of observations made by the author at Bird Key, a small island of the Dry

¹ A Review of the Genus *Piaya* Lesson. By Witmer Stone. Proc. Acad. Nat. Sci. Philadelphia, Vol. LX, Pt. 3, July-Dec., 1908, pp. 492-501.

² The Behavior of Noddy and Sooty Terns. By John B. Watson, Professor of Experimental and Comparative Psychology, The Johns Hopkins University. Papers from the Tortugas Laboratory of the Carnegie Institution of Washington, Vol. II, 1908 (1909), pp. 187-225, pls. i-xi, and 2 text fig. [Separates not dated, but distributed early in March, 1909.]

Tortugas group, during May 4-July 18, 1907. The author says: "The specific object of my stay was to observe as far as possible the details of the lives of the noddy terns (*Anous stolidus*) and the sooty terns (*Sterna fuscata*) during their nesting season on that island. . . . Our interest . . . centered around the portrayal of their activities." The work was conducted from the viewpoint of the psychologist, and is said by the author to be preliminary, and adds: "but since the immediate continuation of the work is not assured, and since work of the kind is more or less 'impressionistic,' the attempt is here made, while the material is still fresh in mind, to enumerate some of the more important problems to be found in the study of these birds and to set forth my tentative efforts to solve them."

A general description of the two species is followed by an account of the geographical situation and history of the present colony of terns, which occupies "a small coral island about 300 yards wide (east and west) by 400 yards long (north and south)," situated about 66 statute miles due west from Key West. "Owing to its juxta-tropical location, its slight elevation, and the condition of its surface (largely coral sand), the actual surface-temperature of this island is very high, ranging at times during the hottest days from 124° to 143° F." The only vegetation consists of bay-cedar bushes, abundant over the central and western parts of the island, and a dense cactus growth over a small portion of the southeastern part, both being used by the noddies for nest-sites.

The food and feeding habits, the mating, nest-building, and the daily activities of both species throughout the breeding season are minutely detailed, together with an account of the development of the young in captivity, and of tests as to recognition between mates, and of the egg, nest, and nest locality. There are also accounts of experiments on distant orientation, and on the "learning of problem boxes" and "the maze." Such a minute and detailed study, conducted with scientific exactness, of the activities of any species of wild bird has doubtless never before been made, and is hence of the highest interest as a contribution to the life histories of the two species here under investigation, aside from its value from the psychologic side. The matter is divided into sections, under special subheadings, each section closing with a brief summary of the subject under discussion.

Under 'Food and Feeding Habits' it is stated that neither species ever touches the water except to drink or bathe; they "never swim nor dive," and in bathing never completely immerse the body, the breast and head being the only parts dipped into the water. In feeding they follow schools of minnows attacked by other fish, and "pick off these minnows as they hop up above and over the surface of the water." They thus differ greatly in habits from our northern species of terns, which freely plunge beneath the surface to secure their prey. The birds appear to fish exclusively in the daytime, they all returning to the island at night. The author gives it as his belief that "these birds rarely leave the island [on their fishing trips] for distances greater than 15 knots." This belief is based on the

testimony of light-house keepers and on a single cruise in a launch for observation.

When the author arrived at the island, on May 4, both species were already actively engaged in nest-building, and some of the birds were beginning to lay. Thus there was little opportunity to observe the mating of either species, which are reputed to mate before reaching the island. He, however, records a "striking series of reactions between two noddies," which he considers may have been a case of mating. The supposed male began nodding and bowing to a supposed female (the sexes are externally indistinguishable), when the latter gave immediate attention and began to extract fish from the throat of the other bird. "The feeding reaction was alternated with the nodding." Then the male brought a stick and deposited it near the female, and then the male attempted sexual relations.

The noddies nest in bushes; the number of nests was estimated at 700, which would give a total of 1400 adult noddies on the island. The nest of the sooty, when any is made, "consists of a shallow oval depression in the sand." The number of nests of this species on the island was found to be (approximately) 9429, which would indicate the presence of 18,858 adult sooties. Where the nests of the sooties "are very numerous they often are not more than 10 to 12 inches apart. On account of this close grouping of the nests," says the author, "and of the quarrelsome nature of the brooding birds, *exact localization of nest and recognition of nest and mate* easily became the most important features in the lives of the sooty terns. This situation affords a convenient starting-point for a psychological study of the behavior of these birds."

Under 'Reactions of the Noddies [and Sooties] observed in nest-building' are given a very detailed account of the actual nest-building of a pair of noddies, and of the selecting of nesting-sites by the sooties and the formation of their nest cavity. Under the caption 'The Daily Rhythm of Activities' are detailed with great minuteness the daily routine of each species, before the egg is laid, during incubation, and after the egg is hatched; from which it appears that in the case of the noddy the male and female pursue a different daily routine during the period of nest-building and before the egg is laid, the female remaining almost constantly at the nest, the male supplying her with food. During the nest-building and egg-laying period the chief points in the lives of the noddies are thus summarized: "(1) there is common activity in the building of the nest; (2) the female guards the nest while (3) the male procures food for both." The manner of feeding the female by the male, as here described, is well worth citing, not only for its intrinsic interest, but also as an illustration of a highly specialized vocabulary: "The male fishes until intra-organic pressure of food in the crop reaches a certain intensity [in other words, until the crop is full]. This acts as a stimulus to return (proximate and distant orientation discussed on pages 224 and 277 respectively). The visual stimulus of mate (and nest and nest locality) coupled with the intra-organic stimuli

just mentioned, condition the feeding reaction [*i. e.*, on seeing his mate he proceeds to offer her food]. On the part of the female we have the intra-organic (hunger) stimulus and the visual stimulus induced by the movements of the male [*i. e.*, the female, being hungry, is willing to be fed]. The male disgorges until there is a cessation of the excessive intra-organic pressure, at which time his feeding movements cease and the female may strike his beak in vain. The female in her turn feeds until there is both a cessation of hunger and a normal intra-organic pressure established. If this takes place before the male is ready, he in turn attempts to further stimulate the female by a slight change in behavior (*i. e.*, 'coaxing' by tapping the female and putting his beak down near her)."¹

In the case of the noddies: "After the egg is laid, a marked change appears in the behavior of both the male and female." Before this period the birds are shy and will not permit a near approach; later on they will viciously attack a human intruder, or will sit on the egg and allow themselves to be caught. In explanation: "It may be said here that the stimulus to the change is to be sought for in the tactical and visual impulses aroused by the egg," or in what, in ordinary parlance, would be termed parental solicitude. The male now no longer feeds the female, each bird taking equal turns at brooding the egg. A tabular statement is given of the shifts made at three nests of noddies for May 21, 22, and 23. The behavior of brooding noddies is thus summarized: "(1) The presence of the egg brings about a change in the distribution of labor between the sexes; (2) the male no longer feeds the female but each sex separately obtains its food; (3) the egg is brooded constantly night and day by both sexes, the male and female relieving each other at intervals varying from 30 minutes to 5 hours, the average interval being in the neighborhood of 2 hours; (4) the most significant general reaction caused by the presence of the egg is the change in the disposition of the birds."

¹ This is not offered in personal criticism of Dr. Watson's excellent paper, but as a protest against the pedantry shown in nearly all modern research along new lines, where a new vocabulary is often invented for the expression of common-place knowledge. New terms are frequently needed for the expression of new facts, new processes, new hypotheses, but how often are well-known facts or principles hidden or obscured to all but the specialist by being clothed in a new verbiage. The science of ecology — the relation of the organism to its environment — *e. g.*, is burdened by pedantic expressions for previously observed and intelligently recorded conditions and relations, which are restated in new and often hypertechnical terms, with the air of their being a new contribution to knowledge. Text-books of the subject are necessarily accompanied with glossaries for the definition of the new terms employed, since they are not to be found in even the latest and most up-to-date dictionaries, while some of them would puzzle a linguist to determine their etymology and significance. The above annotated excerpt from Dr. Watson's paper merely illustrates the tendency to pedantic jargon in many of the newer lines of research. Dr. Watson is of course writing as a specialist in animal psychology, for other specialists in this field of research — not for the layman nor especially for ornithologists — and it is but natural that he should employ the vocabulary approved by his colleagues.

Similar observations are recorded on the behavior of the sooty during the period of incubation, in which are noted changes similar to those recorded for the noddy, with the important exception that the shift at the nest in the case of the noddy occurs about once in two hours, and in the case of the sooty only once in 24 hours. The period of incubation for the noddy is given as from 32 to 35 days; the period of incubation for the sooty was found to be 26 days.

The activities of both species after the egg is hatched are recorded in similar detail. The young of the noddy are fed at intervals varying from one to four hours, and those of the sooty every four to seven hours.

An interesting part of the paper relates to experiments in testing the ability of recognition between mates, and of the parents to recognize nest and young. While it is perfectly evident that such recognition must exist, and cannot with reason be doubted, Dr. Watson's tentative proof that such is the case is of interest. Birds were taken from marked nests, and the birds themselves were also marked with oil paints; while this process caused disturbance in the relations of the birds for a short time, they soon became reconciled to the new conditions.

Experiments in relation to recognition of the egg showed that neither species recognizes its own egg, as is well known to be the case with many other birds. Both species, also, would submit to considerable changes in the size and character of the nest, and even to a slight change in its position, without deserting it, but not without obvious recognition of the changed conditions. A large number of experiments have relation mainly to the length of time required for adjustment to the new situation. Where the environment was markedly altered the bird remained undisturbed so long as the position of the nest was not disturbed. Says Dr. Watson: "If one recalls the conditions under which they [the sooties] lay their eggs, namely, in open spaces and at distances apart sometimes not greater than 10 to 14 inches, one can not but admire the exactness and ease with which the sooty approaches her own nest." This certainly shows a high power of discrimination, quite in harmony with the action of birds in general, and perhaps renders not less wonderful, but perhaps less astonishing, the ability of migratory birds to find their way back to their own former nesting-sites after hundreds and even thousands of miles of migratory travel. With such power of local orientation as all birds show in the matter of the nesting-site, is it so very strange that they should be able — accidents and stress of weather aside — to orient themselves on their migratory journeys? While the exact nature of this ability may not be at present known, its possession is beyond question.

Dr. Watson's experiments on distant orientation are here for the first time fully stated, but the principal facts have already become more or less current. His comment thereon is disappointing inasmuch as no explanation is attempted. But perhaps this was to be expected for, as he says: "the facts obtained from them are extremely difficult for current theories of distant orientation to explain." These experiments, briefly

stated, are: (1) Six noddies, "marked characteristically and individually with oil paints," were put on board the laboratory launch bound for Key West; two, liberated when 19.5 statute miles distant, returned to their marked nests in 2½ hours after they were released; two were liberated at a distance of 44.75 statute miles and returned to their nests in 1½ hours after their release; two were liberated at Key West, 65.8 statute miles distant, and reached their nests, one 11 hours later and the other about 23 hours later, night intervening when the birds probably did not attempt to fly.

(2) Three noddies and two sooties, captured and marked, and their nests likewise marked, were taken, June 13, via Key West, to Cape Hatteras and liberated 12 miles east of the Cape. Several days after the marked sooties were found at their nests, and a few days later one of the noddies was seen attempting to alight on its nest, but its mate, having formed new 'affiliations', this was not permitted. Dr. Watson states that he has no doubt the other two noddies returned to the island and were likewise not permitted to return to their nests. The distance in a direct line from Bird Key to Cape Hatteras is about 850 statute miles, and by way of the coast about 1080 statute miles. The birds were thus taken hundreds of miles to the northward of their normal range, yet were able to return quickly to their nests on Bird Key.

(3) On July 8, two noddies and two sooties, marked for identification, were taken to Havana; they were released on the 11th, and reached Bird Key on the following day. The birds were in such poor physical condition from the strain of caring for their nearly full-grown young that it was decided not to take them further away before releasing them.

In the present connection there is space merely to call attention to Dr. Watson's interesting experiments with young terns in learning the 'problem box' and the 'maze,' which are of special interest to the psychologist rather than to the ornithologist. Dr. Watson's paper, as amply shown above, is noteworthy from the double viewpoint of ornithology and psychology; it is a detailed and continuous study of the activities of two species of a very interesting group of birds during nearly the entire season of reproduction. The accompanying eleven plates illustrate the nesting attitudes of the old birds, young of various ages of both species, groups of nesting sooties, flashlight pictures, to show the possibility of studying the behavior of the birds at night, the character and grouping of the nests of the noddies, and the group activities of both sooties and noddies.—J. A. A.

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CORRESPONDENCE.

Where the Skeletons of American Birds may be Studied.

EDITORS OF 'THE AUK':—

Dear Sirs:—It is not my intention in the present communication to furnish a list of either public or private institutions in this country where may be found, for the use of students of the subject, a collection of skeletons of birds, much less to supply the names of those possessing such material and who are willing to place it at the disposal of workers and authors in this department of comparative anatomy. Not that such a list would not be of use and value to ornithotomists generally were it published, but, so far as my knowledge carries me, the necessary information for it has, up to the present time, never been prepared. On the other hand it is hoped that it may prove to be of some service to students of the anatomy of birds to know where they may examine and study a representative collection of skeletons of the Class, all of which have been figured, described and published in various scientific periodicals and found in all the larger libraries everywhere. Reference is here made to the material which composed what was up to a few months ago my own private collection.

Through donation this is now the property of the New York State Museum at Albany, where it is being classified and otherwise cared for, in order to render it available to such students having occasion to utilize it in their work. It is in charge of Doctor John M. Clarke, Director of the Science Division of the New York State Education Department at the State Hall in Albany, who doubtless will be glad to furnish any information in regard to it. So far as American species go, this is probably the largest collection of the kind in this country, and the specimens all being unmounted and described, they present data and the opportunity for study and comparison, not as yet found elsewhere in this country. Either perfect skeletons or parts of skeletons here represent nearly all the main genera of the birds of the United States. Moreover, the majority of them are *types*, thus rendering them especially valuable for scientific reference. Perhaps I may be pardoned for alluding here to the many cherished associations that are, for me, forever bound up in this collection. It took many years to bring it together, and in the work I was not only assisted by members of my immediate family, now gone, but by many others whose names we find among those on the last few pages of the autumn issue of 'The Auk.'

It is a satisfaction to know that this collection of skeletons is now in such good keeping, and from *Aechmophorus* to *Sialia* I trust they will do duty for many a year yet to come.

In closing, it may be of interest to my friends to know that there is now passing through the press a special Bulletin, under the direction of the

Education Department at Albany, which is devoted to four of my osteological memoirs on birds. They cover the *Accipitres*, the *Anseres*, the *Gallinæ*, and a special one on the *Coccyges*. Some two hundred heretofore unpublished figures illustrate the text.

Very faithfully yours,

R. W. SHUFELDT.

NOTES AND NEWS.

CHARLES ALDRICH, a Fellow and one of the Founders of the American Ornithologists' Union, died at Boone, Iowa, March 8, 1908, at the age of 80 years. In accordance with a standing order of the Union respecting deceased Fellows, a memorial of his life and work will be presented at the next stated meeting of the Union, and published later in 'The Auk'.

EDWARD SEYMOUR WOODRUFF, an Associate Member of the A. O. U., died of typhoid fever at his home in New York city on January 15, 1909. He was the youngest son of Charles Hornblower and Catherine Sanford Woodruff, and was born in New York City on December 23, 1876. He was graduated from the Academical Department of Yale University with the class of '99, afterwards, for a year, pursued a special course in biology at Johns Hopkins University, and later entered the School of Forestry at Yale from which he obtained the degree of Master of Forestry with high honors in 1907. Shortly afterward he received an appointment as State Forester of New York, which post he filled with great ability up to the time of his death.

Much of Mr. Woodruff's early life was spent at his country home in Litchfield, Conn., and here while wandering in woods and fields he developed a taste for natural history in several of its branches, and cultivated that love of prying into Nature's secrets which is the greatest asset of every true naturalist. He was always deeply interested in ornithology, and leaves behind him a fine collection of birds as a monument of industry and devotion to this science; while the excellent notes and papers which he published gave promise of still more valuable ones to follow. Among them may be cited, as of exceptional value, the carefully prepared list published in 'The Auk' for April, 1908, with title 'A Preliminary List of the Birds of Shannon and Carter Counties, Missouri,' and 'The Ruffed Grouse — A Study of the Causes of its Scarcity in 1907,' published by the Forest, Fish and Game Commission of New York, in 1908. Both are models of their kind, the former dealing with the scientific side of systematic ornithology, the latter covering one of its economic aspects.

For the profession of forestry, Mr. Woodruff was admirably fitted by education and by temperament, and he had already made his mark in a career that promised much for the country at large. He was the right man in the right place, and forestry can ill afford to lose men of his sterling qualities and mental calibre.

Those of us who have been fortunate in knowing Mr. Woodruff as a friend cannot soon forget a personality that never failed to attract even strangers through a naturalness of manner that bespoke a warm heart and a sincerity of purpose beyond the ordinary. We feel that ornithology, too, has suffered a loss, for ornithologists will miss from their ranks a companion who was filled with enthusiasm and energy.—J. D., JR.

THE Thirteenth Annual Meeting of the Audubon Society of the State of New York was held at the American Museum of Natural History, March 18, 1909. The President of the Society, Henry Fairfield Osborn, presided. The report of Miss Emma H. Lockwood, Secretary-Treasurer, showed that the Society had been active in protecting the birds of the State, and in supplying literature relating to bird protection and bird study for the use of teachers and others, so far as its available funds permitted. Mr. William Dutcher, the President of the National Association of Audubon Societies, and Chairman of the New York Society's Committee on Legislation, presented a report on current legislative matters with particular reference to a bill now before the New York Legislature, the passage of which would practically prohibit the sale of the plumage of all New York State birds for millinery purposes. Mr. Dutcher asked all the members of the Society to urge their representatives at Albany to support this bill.

Following Mr. Dutcher's report, Mr. Louis Agassiz Fuertes, the well-known bird-artist, made an address on birds and their music, which he illustrated with chalk sketches in color of the birds and imitations of their songs. There was also an exhibition in the Bird Hall of the Museum of a large series of paintings of birds by Mr. Fuertes.

THE Darwin Memorial Celebration held at the American Museum of Natural History, February 12, 1909, by the New York Academy of Sciences, was made the occasion of the presentation by the Academy to the Museum of a bronze bust of Darwin, with appropriate ceremonies. It was permanently installed at the entrance to the Synoptic Hall, which was renamed and dedicated as "The Darwin Hall of Invertebrate Zoölogy"; bronze tablets thus inscribed have been placed at the entrance to the hall. The presentation address was made by Charles Finney Cox, President of the Academy, and the address of acceptance by Henry Fairfield Osborn, President of the Museum. Other addresses were by Prof. John James Stevenson on 'Darwin and Geology'; by Dr. Nathaniel Lord Britton on 'Darwin and Botany'; by Dr. Hermon Carey Bumpus on 'Darwin and Zoölogy.'

The celebration was accompanied by an exhibition of Darwiniana (published works, portraits, and letters of Darwin), and specimens illustrating various aspects of the evolution of animals and plants, living and extinct, arranged in fifteen categories, with reference to as many special features of evolution. The exhibition remained on view from February 12 to March 12, and formed an attractive as well as instructive display.

As everybody knows, or has had the opportunity of knowing, the Roosevelt Expedition to Africa is not merely a hunting trip for the gratification of the big-game aspirations of an ex-President of the United States, but a thoroughly organized expedition in the interest of the United States National Museum and of science. The money for its equipment and maintenance, beyond the personal expenses of its chief, has been raised by subscription through the efforts of the Secretary of the Smithsonian Institution, and the personnel has been chosen from the leading experts in field work. The personal interest of Theodore Roosevelt in natural history research is well known, and in Major Edgar A. Mearns, a Fellow and one of the Founders of the American Ornithologists' Union, and an ornithologist and mammalogist of demonstrated ability, he has a medical adviser and a scientific assistant that ensures energetic and intelligent work. Edmund Heller and J. Alden Loring are collectors of wide experience and exceptional ability. Under such conditions, barring accident or illness, the results of a year's work in British East Africa by such a staff should be of the greatest scientific importance and bring to this country a greatly needed collection of the leading forms of the vertebrate life of a region at present poorly represented in American Museums. We are sure the expedition will have the hearty good-speed of every reader of this journal.

THE Avicultural Society of California has begun the publication of a bimonthly official magazine, called 'Bird News,' "devoted to the interests of the bird fancier." Volume I, No. 1, for January-February, 1909, consists of eight octavo pages of well printed and well edited matter pertinent to the interests it represents. Editor, Frederick W. D'Evelyn; Business Manager, W. W. Cooley, 717 Market St., San Francisco, Cal.

THE Spring announcement of new books by Henry Holt and Company contains 'Birds of the World,' by F. H. Knowlton and Robert Ridgway, with illustrations in color. \$7 net.—The Houghton, Mifflin Company announce 'Birds of the Boston Public Garden, a Study in Migration,' by Horace Winslow Wright, with an introduction by Bradford Torrey.